

2.3 New remote services

2.3.1 Novel broadband-based services: new opportunities for people with disabilities

Broadband trials by the National Post and Telecom Agency (Post- och telestyrelsen PTS), in Sweden

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PTS seven broadband trials

Broadband technology has become accessible for a steadily increasing proportion of the population in Sweden. With the aid of more rapid data transmission it has become possible to send and receive large quantities of information via computer networks. The opportunities for communication have broadened with e-mail, chat and video communications in real time. It has become easier to choose the means of communication that best suits each individual. For people whose opportunities for communication are limited owing to a disability, IT technology in general and broadband in particular can often make things much easier.

In December 2001, the National Post and Telecom Agency (Post- och telestyrelsen, PTS), in Sweden was commissioned by the Government to conduct a number of trial operations where broadband technology was utilised to create new services for people with a disability. One important issue was how the new technology could be used and target-group adapted for these groups. The following seven trials have been conducted:

- *Service centre for people who are deafblind*
- *Distance education for people with mild aphasia*
- *Digital distribution of talking books to university students*
- *Broadband for people with intellectual impairment*
- *Distance education in sign language*
- *Winning Communication – distance guidance*
- *Mobile video communications for people who are deaf.*

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A common feature of these trials is that standardised technology has been used to the greatest extent possible. By using, whenever possible, existing aids and standard equipment, such as web cameras and ordinary personal computers, these solutions prove more cost effective for society and users.

A socioeconomic evaluation of these trial services has been undertaken with the assistance of the Center for Medical Technology Evaluation at Linköping University. The so-called 'ICF-model' (International Classification of Disability, Functioning and Health) has been used as an evaluation model.

Service centre for people who are deafblind

Being deafblind involves special problems that affect everyday life, for example, reading food packaging, trying to find something you have lost that is actually lying right under your nose, or quite simply checking whether you are neatly and properly dressed.

Communication with others is a common problem for people who are deafblind. This can sometimes be resolved with the help of a person with normal vision, a personal assistant, a relative or someone who can be around to help and who can communicate with a deafblind person.

The trial 'Service centre for people who are deafblind' aims to act as a supplement to this, by a person who is deafblind being able to make use of technology to get help in those cases where it suits them. Many situations can be solved rapidly and easily with the remote service. This means that people who are deafblind will not be so dependent upon help from people in their immediate surroundings.

In the trial conducted by the Association of the Swedish Deafblind (FSDB), a service was developed whereby a person who is deafblind can communicate with a manned service centre. With the aid of a computer-based terminal with cameras, the person who is deafblind can contact the service centre via broadband. The conversation is conducted through pictures, text and speech using the combination that is most suitable for the deafblind person.

The most common kind of conversation comprises the person who is deafblind using sign language to speak with the service centre, which responds with text. The user reads the text with the aid of a Braille display which is connected to the computer. If the user has residual vision or hearing, the service centre can also sign

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or speak. The controlling information can also be provided in another form, for example, by a vibrating device that the user can feel on their body.



Figure 2.12 Service centre for people who are deafblind.

With the aid of cameras, the user can be seen or display an object at home that the service centre can see. A moving, zoomable camera is used to show various parts of the room, for example, to find a particular object or in order to read the text on a jar.

During the trial period, a service centre was established and manned Monday to Friday, 08.00 to 17.00, by personnel with backgrounds as sign language interpreters. The trial has been received positively by the four deafblind persons who used the service. The assessment was made that this method of communication provides people who are deafblind with new opportunities to communicate with everybody and that the services provided by the service centre are important and valuable. It is also considered that people with visual impairment could benefit from a similar service centre.

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Facts

Technology

Computer connected to broadband with software for total communication, screen reader program and speech synthesis. Braille display, a stationary analogue video camera for communication and a moving, zoomable and remotely controlled camera connected to a video server for presentations.

Target group

FSDB has 400 deafblind members, but there are also deafblind people who are not members. Another potential target group is people with visual impairment.

Number of users

4

Project period

February 2003 - March 2004

Distance education for people with mild aphasia

It is becoming increasingly difficult to justify why students should live away from home in order to participate in residential courses at folk high school. Distance courses allow students to continue living at home while they are studying, which is economical and often socially advantageous. If a prospective student has a disability, the need to be able to remain in the home environment increases while the need for contact with the outside world must also be met. People with aphasia are often affected by a combination of disabilities, primarily difficulties with communication, both spoken and written, together with some impaired motor functions.

The aim of the distance education trial was primarily to consider adapted forms for distance instruction using the best possible broadband technology available. The vision was to develop and expand the work within distance education so that people with mild aphasia would be given new opportunities for education and personal development. This provides participants with the opportunity to attain an enhanced quality of life and in some cases to return to working life.

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Figure 2.13 Distance education for people with mild aphasia.

For the group 'people with mild aphasia', the possibility of combining speech and pictures is important to be able to communicate as effectively as possible. To share documents, make use of a 'whiteboard' and make presentations using a computer were common components for the training.

Karlskoga Folk High School, which was responsible for the implementation of the project, has long experience of teaching people with aphasia. As part of the trial, they have conducted distance education at scheduled times in, among other subjects, Swedish and presentation techniques. Eight participants from various parts of Sweden participated in the trial. Regular tuition was provided, three times a week, with positive results, and the participants also made use of the opportunity for sound and video contact for their own discussions with each other. The social aspects of being able to use video conferencing to communicate with other people with aphasia outside the teaching, has also been very much appreciated by participants in the trial project.

The trial enhances the availability of effective adult education and means that it is also easy to reuse the courses that have been prepared.

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Facts

Technology

Computer connected to broadband with web camera and headset, video conference software (Click-to-Meet).

Target group

People with aphasia.

Number of users

8

Project period

July 2002 - December 2003

Digital distribution of talking books to university students

University students with a reading disability – people with visual impairment, dyslexia and restricted mobility – are now able to get their course literature as talking books. Students can order the talking books, which are then sent via post from the Swedish Library of Talking Books and Braille (TPB) in Stockholm. Besides the time that the dispatch actually takes, the borrower is dependent upon the book being in stock, that is to say that no-one else has borrowed it. However, as talking books are now digital produced in the international standard DAISY, it is possible to handle them in a different way.

The trial in question is a broadband service that provides access to talking books via digital distribution to students with a reading disability. A central digital talking book archive, which has approximately 13 000 titles, is being built up by TPB, where all recorded university literature is made available for downloading. The aim is to provide access to literature through broadband technology to students with a reading disability, on equal terms with other students.

The project has been conducted by TPB, which is the authority responsible for satisfying the needs of people with visual impairment and other people with reading disability for literature in the form of talking books, Braille books and electronic media.

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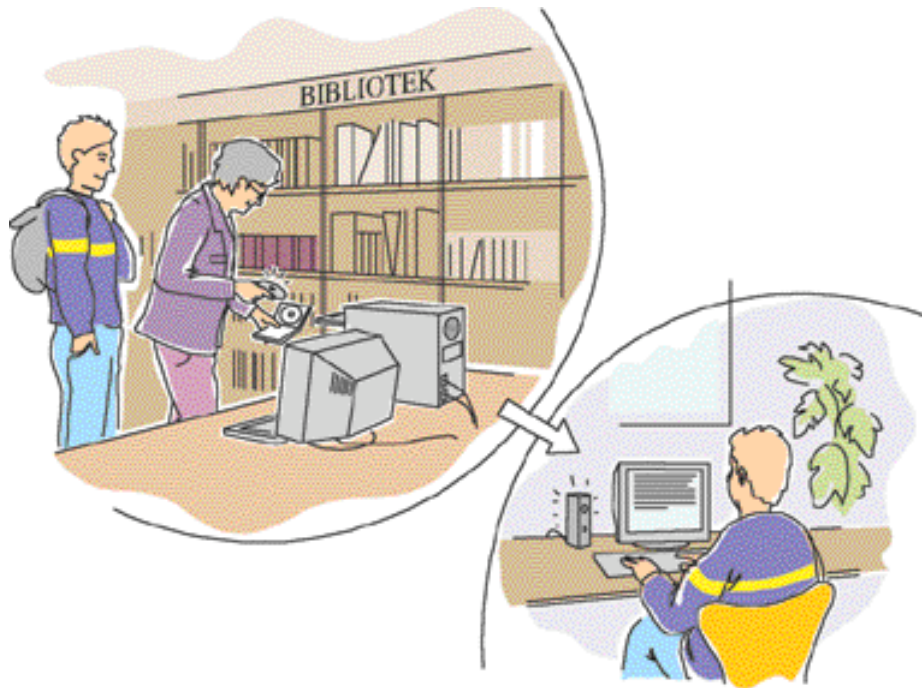


Figure 2.14 Digital distribution of talking books to university students.

Through SUNET, the university computer network, the four university libraries that have participated in the trial have access to broadband with high transmission capacity. The average talking book is 225 MB in size and university books are often twice as big, which imposes demands for rapid connections and an acceptable download time. Equipment for downloading and burning CD-ROMs has been set up within the library. When a student comes to the university library to borrow course literature, the librarian simply downloads the talking book from the talking-book archive and transfers it onto a CD-ROM for the student to borrow. The system is simple to use and the talking books in the archive are always available, which means that there is no waiting list.

The project also has two sub-projects where sub-deliveries and so-called 'streaming reading' are being tested. If the book is in the process of being recorded, it can be downloaded to the student bit by bit in pace with the progress of the recording. This can sometimes be decisive for keeping up with course studies. Streaming reading of talking books over the Internet means that students can themselves connect from home and read the relevant books, without needing to go to the local library to download the talking books.

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The trial subjects who participated in the project have made frequent use of the opportunity to download talking books and university libraries have demonstrated great interest, even those who have not participated in the trial. In addition to the trial subjects and the university libraries that participated in the project, approximately 100 other students have made use of the service and 13 new university libraries have gained access to the archive. The broadband service has now been established as a regular service.

Facts

Technology

University library: Computers with a rapid broadband connection and CD burners. The reading program EaseReaderOnline was used for streaming reading.

Target group

People with reading disability (for example, people with visual impairment, dyslexia, impairment to mobility)

Number of users

49

Project period

June 2002 - May 2004

Broadband for people with intellectual impairment

Intellectual impairment involves, among other things, difficulties in dealing with abstract concepts and contexts, for example, time, quality, quantity, cause and spatial relations. One consequence of this is that people who are disabled are limited by their capacity to communicate with each other at a distance, for instance, by telephone. If two people can see each other, and in this way perceive body language, pronunciation and tone on the part of the person they are talking to, communication is made significantly easier.

Being in control of your everyday life, for example, by gathering and understanding public information, news, participating in leisure interests with others, shopping, attending to your finances, writing to authorities and friends, are important

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activities that allow full participation in society and are essential for an independent life. For many people with intellectual impairment, participation and the opportunity to live independently is severely restricted. A computer with a broadband connection provides opportunities for enhanced participation and independence.

For the trial 'Broadband for people with intellectual impairment', two-way video communications with high audio and picture quality are essential for communication at a distance to function. The trial was implemented in collaboration with the Municipality of Bollnäs, the Grunden Association in Gothenburg and Höghammar School in Bollnäs.



Figure 2.15 Broadband for people with intellectual impairment.

The objective of the trial was to determine the benefits of broadband for people with intellectual impairment. One important aim was to be able to communicate and cooperate individually or in groups with the aid of two-way video communications via the Internet. Another aim was to test the possibilities of people with intellectual impairment to use the services on the Internet, for example banking, e-commerce and other services. In addition to these activities, the aim was also to provide participants with an opportunity to discover their own uses and benefits from broadband.

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Members of the Grunden Association in Gothenburg and pupils at Höghammar School in Bollnäs participated in the trial. For example, they tested various services on the Internet and pooled their experiences in order to learn more about the Internet as an everyday tool. Video communication was often conducted from several people to several people, that is to say, between groups. The working groups also collaborated on a joint web newspaper, publishing results and experiences from the trial.

Experiences from the trial have shown that users have rapidly assimilated this new method of communication and felt both the benefit and joy of using it. The Internet and video-supported communications can facilitate distance communication. This particularly applies to the opportunity to establish new contacts beyond the individual's circle comprising other people with disability. This is very important as many people with intellectual impairment encounter impediments that limit their opportunities to meet other people.

Facts

Technology

Studios (Gothenburg and Bollnäs): Computer connected to broadband, large screen, video-conference program (Click-to-Meet), web camera, digital video camera for better quality and documentation.

Home environment

Computer connected to broadband, video-conference program (Click-to-Meet), web camera, and headset.

Target group

People with intellectual impairment

Number of users

6 people at Grunden Media in Gothenburg and 5 pupils at Höghammar School in Bollnäs.

Project period

July 2002 – May 2004

Distance education in sign language

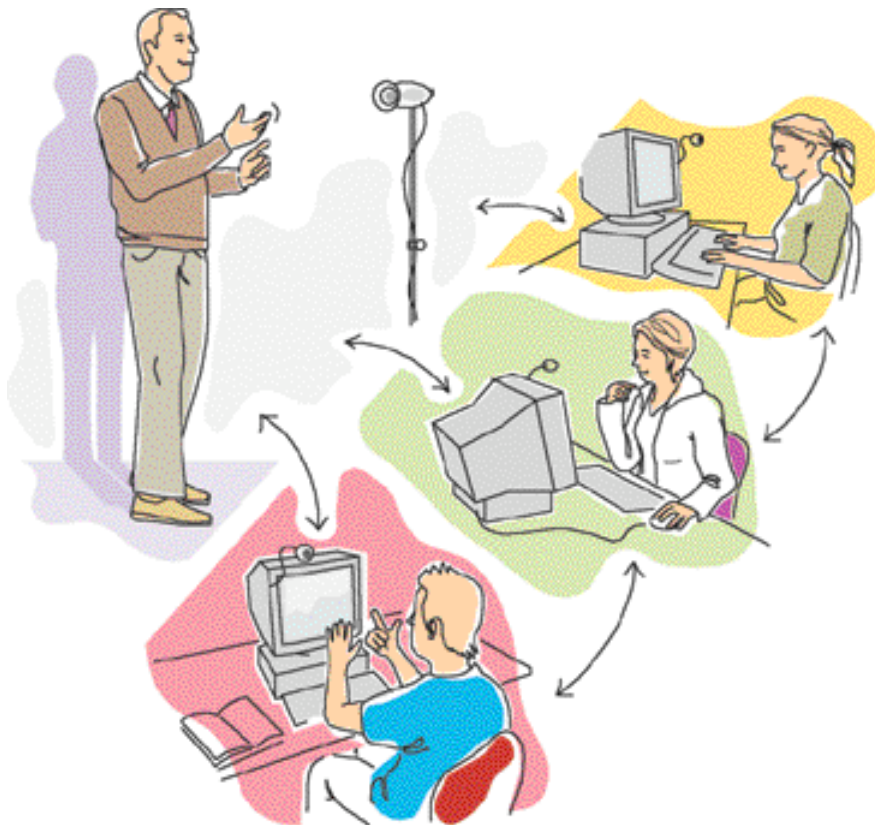


Figure 2.16 Distance education in sign language.

Sign language is the first language of deaf people and it is consequently important for people who are deaf to gain access to education in sign language. The adult education courses in sign language that are currently on offer today for people who are deaf are often arranged at boarding schools far from home. There is consequently a great need for and interest in distance education.

The aim of the project was to use the framework of a flexible course to create an opportunity for sign language interaction between course leaders and participants. Communication takes place by video over the Internet, either as direct communication or through the participants downloading video files or sending video messages. The project is being conducted by the Swedish National Association of the Deaf (SDR) in collaboration with Västervik Folk High School in Leksand.

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The project basically employs three methods of communication for interaction between the teacher and the participants:

- *Video files with course material and assignments in sign language that the participants access via the Internet*
- *Participants' feedback to the teacher in sign language via recorded video messages*
- *The teachers and participants meet for scheduled lessons in a virtual classroom on the Internet through videoconferencing.*

The course should be easily accessible, through a user-friendly interface, and at a reasonable cost for the individual user, without lowering educational standards. The communication of high quality video over the Internet imposes great demands on high bandwidth, but the equipment that participants require is a standard computer, web camera and software. The course methods may also benefit people who need lip-reading or signs to support their understanding.

Experience from the trial is that the technology functioned beyond all expectation and the pupils were very positive towards the opportunity of communicating in their first language at a distance. "Wonderful contact from 200 kilometres away!", according to one participant.

Facts

Technology

Computer connected to broadband, web camera, videoconferencing software (Click-to-Meet).

Target group

People who are deaf or people with hearing impairment with sign language as their first language.

Number of users

13

Project period

July 2002 – April 2004

Winning communication – distance guidance

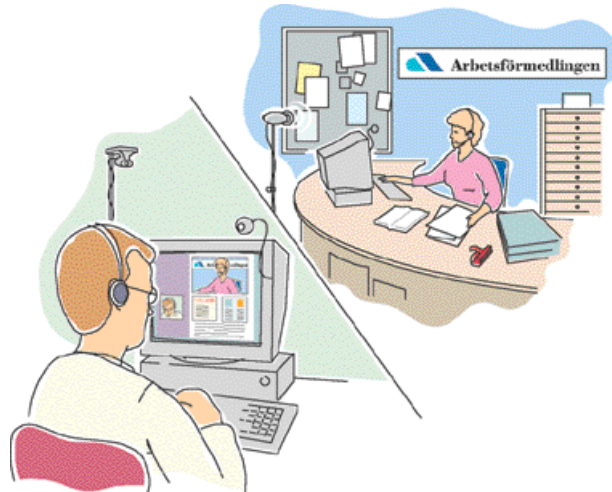


Figure 2.17 Winning communication – distance guidance.

Considerable resources are required to provide people with disability with effective guidance, for example, about labour market issues. Limiting factors include access to specialists in labour market guidance for deaf people and sign language interpreters. Resources are also unevenly distributed across Sweden, which means that it can take a long time for people with disability to get to meet these guidance specialists.

The aim of the trial project known as 'Winning Communication' was to develop ways of using video communication in regular work at the employment offices. The primary goals for the group comprising jobseekers with disability were to facilitate more rapid contact with specialists at the employment offices and thereby enhance opportunities of finding work. At the same time, this would reduce both travel costs and travel time.

Guidance can be provided individually and for groups. When the counsellor, together with the applicant, identified the service need and decided on the most appropriate method, the applicant was offered the opportunity of meeting an expert at a distance. Together with his/her caseworker, the applicant met up with, for example, a psychologist, teacher of the deaf/hard of hearing, teacher of the deaf, vision consultant, occupational therapist or other expert via video communication. Communication is conducted using video, text and voice and the counsellor is able to display documents and websites. The technical equipment is

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installed at ten employment offices in the counties of Uppsala and Västmanland, which means that people with disability can visit their nearest employment office.

Experiences from the trials have been very positive. Ten employment offices took part and guidance was provided both individually and with groups of up to five people. During the trial period, distance guidance was integrated into the regular operations. Meetings were considered to be effective and there were few limitations for the scope of use of the concept.

The project also provides the preconditions for greater cooperation and a more efficient transfer of competence between the staff at the employment offices who work with people with disability.

This trial was based at the County Labour Board in the County of Uppsala and has been co-financed by the National Labour Market Board (AMS). Methods for providing distance guidance for deaf people have been applied in Uppsala for the past couple of years with very good results. As distance guidance is now being integrated into the regular operation, it will also continue in the future after the conclusion of the trial project.

Facts

Technology

Computer connected to broadband with video camera, microphone and video communication software.

Target group

People with impaired mobility, deaf people, people with hearing impairments, people with visual impairments, people with intellectual occupational disability, applicants suffering from asthma/allergies, people with dyslexia, people with heart and/or lung diseases and other somatic-related occupational disabilities.

Number of users

37

Project period

July 2002 – June 2004

Mobile video communications for people who are deaf

Video calls via mobile telephones brought about a revolution in the communication opportunities for people who are deaf. Text messages (SMS) soon became an important means of communication for deaf people, although it uses the second language of deaf people, Swedish. Video calls make it possible for deaf people to use their first language – sign language – for mobile communications.

The third generation mobile telephony, 3G, has high capacity and is capable of transmitting moving pictures, essential for allowing sign language use with a mobile. The trial project 'Mobile video communications for people who are deaf' aimed to investigate how deaf people can use 3G telephones in order to communicate with sign language. The project period was May 2004 to February 2005.

The trial group conducted video calls in real time, and also sent video messages to each other. The possibilities that 3G technology offers were investigated and evaluated by testing the various terminals and 3G networks. In the course of the trial period, video calls became increasingly common in Sweden among people who are deaf.

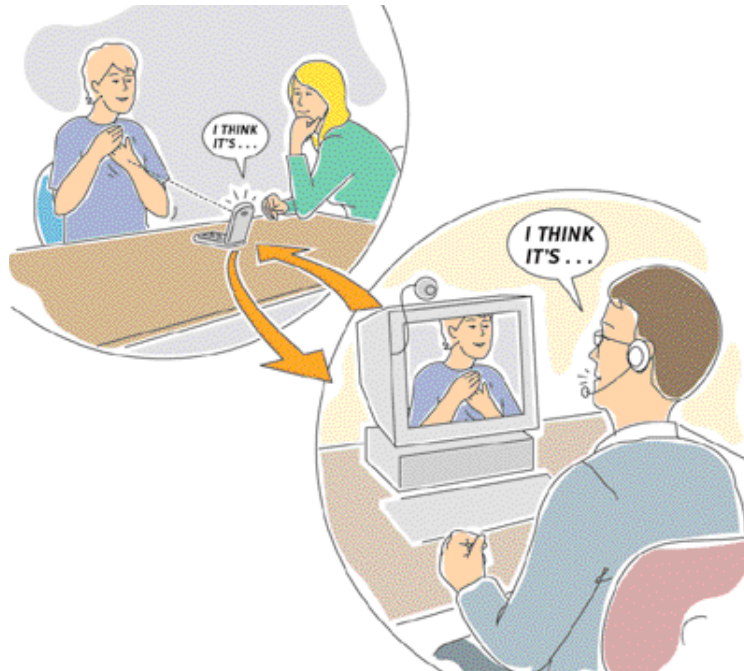


Figure 2.18 Mobile video communications for people who are deaf.

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The positive experiences from the first trial resulted in a new development project being initiated during the spring of 2005. This was to test a communications and interpreter service for 3G calls. These services mean that a deaf person can contact a sign language interpreter who interprets between sign language and speech. In this way, a deaf person can communicate directly with a hearing person. This may, for instance, involve distance interpretation, for example, when visiting the bank or during a spontaneous meeting. It may also involve a communicated call, for example, when one deaf person wishes to make a call to a hearing person or vice versa. In this way the deaf person becomes less dependent upon physical access to interpreter resources and the need to book such services well in advance, which creates opportunities for more spontaneous communication.

The new project aimed to develop both technology and methodology for receiving and dealing with 3G calls at an interpreter centre. The project is now finalised and the functionality is since September 2006 integrated in the service provided by the Relay service for video telephony operated by Tolkkentralen in Örebro Läns Landsting (the Örebro County Council Interpreter Centre).

Facts

Technology

3G technology and telephones with video functionality.

Target group

People who are deaf and hearing-impaired persons who use sign language as their first language.

Number of users

Approximately 100

Project period

April 2005 – February 2006.

Conclusion

Broadband communications have demonstrated that they can play an important role in providing vital services to people with special needs for communication. The technology is mature enough to provide advanced services and it is reasonable to expect that such services will become more widely available as long as organizational and economical aspects can be solved.

References

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