

2.5 User participation in technology

2.5.1 Example of procurement specifications Functional specification for terminal procurement in Sweden

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Procurement of technical aids for electronic communication

The Swedish Handicap Institute (HI) supports the Swedish principals in purchasing technical aids for people with disabilities. This is done through procurements resulting in call-off contracts, from which the local health authorities can call off directly at fixed prices and conditions. HI provides the principals with this service for many categories of technical aids, among which are text telephones and videophones. As this text is written, HI has just provided the principals with a call-off contract for text telephones, videophones and total conversation terminals, i.e. terminals for communicating with video, text and sound simultaneously. The procurement started in December 2005 and the contract runs from July 1st 2006 until June 30th 2008.

Qualification of suppliers included, among other parameters, requirements on the suppliers' economic stability and ability to provide service to end users.

Requirement specification

Qualification of tenders in the procurement included testing of terminals (text telephones, videophones or total conversation terminals) according to the requirements in *Requirement Specification – Total conversation Units, Text telephones and Videophones*¹ (requirement specification). The requirement specification was put together by the Swedish Handicap Institute along with Post- och Telestyrelsen (PTS, the National Post and Telecom Agency in Sweden) and experts from Tolkcentralen i Örebro, which runs the Swedish video relay service for deaf and hard-of-hearing persons. The intended terminal user is a hard-of-hearing person, a deaf person, a speech-impaired person or a relative of either of these.

The requirements listed in the document are functional, in that they are designed according to the intended user's needs, not the specifications of terminal

¹ Requirement specification – Total conversation units, text telephones and video telephones, Hjälpmedelsinstitutet 2005-09-01, http://www.hi.se/templates/Page____806.aspx.

equipment occurring on the market. The terminal equipment can thus follow any standard and any configuration, given that the requirements are fulfilled. It is assumed that the suppliers and manufacturers find it in their common interest to assure interoperability in between terminals, since terminal equipment which cannot be used to communicate with terminals from other manufacturers will not likely be prescribed.

Two kinds of requests are issued, requirements and guidelines. Terminals have to meet the requirements in order to qualify for the contract. The guidelines, however, are looser in that they suggest functionality that a lot of users may wish for but don't need for basic communication. The guidelines point out functional aspects that may become requirements in a later edition of the requirement specification.

Functionality

Requirements on functionality can be divided into several parts, based on communication method. The following types of requirements can be identified:

- *General requirements: applies to text telephones, videophones and total conversation terminals*
- *Requirements for video communication, e.g. frame-rate, resolution, blur, frame delay. These requirements are mainly based on the video quality needed for sign language*
- *Requirements for text communication, e.g. definition of the minimum window of displayed text, possibility to delete characters on own and other party's screen, maximum delay between input and transmission of characters.*

The requirements on video communication are applicable only on videophones and total conversation terminals and the requirements on text communication are applicable only on text telephones and total conversation terminals.

General requirements

These are requirements on the terminal's user interface, instructions for use and other factors independent on the type of communication.

Some of the most important general requirements are listed below:

- *Text on and beside buttons shall be in Swedish*
- *The supplier shall inform in the product information about the requirements on computers and supplementary equipment intended to be used with the*

terminal. Information about appropriate firewalls and routers should also be provided by the supplier

- *The supplier shall provide HI with information about the terminal's compatibility with terminals from other suppliers*
- *Information on how to call "112" (the Swedish emergency number) shall be available to users or prescribers of terminals*
- *Two way communication – the call parties shall be able to talk at the same time with each other*
- *Secrecy – the user shall be able to turn off the microphone and/or speakers, and there shall be a visual indication when microphone or speakers are turned off*
- *All events indicated with an acoustic signal shall also be indicated with a visual signal*
- *Possibility to connect alert system equipment so that the user can be informed of incoming calls.*

Requirements for video communication

The requirements for video communication focus on video quality, temporal effects and screen and camera quality.

The requirements are, in part, based on the document from the International Telecommunication Union: *ITU-T Series H: Audiovisual and multimedia systems – Application profile – Sign language and lip-reading real-time conversation using low bit-rate video communication*².

The requirements considered to be of most importance for sign language communication are:

- *Audio and video simultaneously*
- *Frame-rate equal to or above 20 frames per second. This requirement is necessary for sign language in normal speed*
- *At least CIF³ resolution, i.e. 352 x 288 pixels*

² Series H: Audiovisual and multimedia systems – Application profile – Sign language and lip-reading real-time conversation using low bit-rate video communication (05/99), International Telecommunication Union

³ Common Intermediate Format. Frame format defined in ITU-T H.261 from the International Telecommunication Union. Each frame consists of 352x288 pixels.

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- *Delay of image and sound between two terminals shall not exceed 0.4 s. This is necessary to avoid calling parties interrupting each other*
- *Possibility to see own image during call as well as other party's image*
- *If the terminal includes camera, the camera angle shall exceed 42°.*

General requirements for text communication

The requirements for text communication are mainly based on requirements inherited from outdated requirement specifications for text telephones⁴. Even if the communication network has changed from switched telephone networks to packet-based data networks, the user's needs have not changed.

The most important requirements for text communication are:

- *Possibility to use 'speak-directly/listen-directly', i.e. to alternate between text mode and voice mode*
- *Possibility to delete the final character on own and other party's display*
- *The delay between input from the sender and presentation at the receiving end shall not exceed 1 second*
- *Interoperability with legacy text telephones still in use in Sweden.*

Requirements for legacy text telephones

In recent years, there has been a remarkable development in communication networks and services, and many videophones and total conversation terminals use IP networks for communication. Fast Internet access is available to the general population in Sweden, and most deaf people using sign language can use video telephony to communicate to each other and the video relay service. There is, however, a group of people who have special needs, in that they cannot sign and have limited experience of computers and advanced technical equipment. Elderly people who have become deaf or hard-of-hearing at an age when they have fully developed speech usually aren't motivated or have the need to learn sign language. For some of these people, the best solution for telephone communication is the legacy text telephone, since it is usually designed for the sole purpose of text telephony and hence is simple to use.

The need for legacy text telephones will persist until solutions for IP-based text telephony with equally simple handling procedures appear.

⁴ Kravspecifikation – Texttelefoner, Hjälpmedelsinstitutet 2002-03-01

Requirements on legacy text telephones are:

- *Communication compatible with ITU-T V.21⁵*
- *Text coding in ASCII with Swedish supplement.*

Future use of requirements

By forming the requirements out of the user's needs, they won't have to be updated too frequently.

A revised version of the requirement specification was accepted in May 9th 2006 by the Nordic Forum for Telecommunication and Handicap (NFTH) as a set of guidelines for testing of stationary text telephones, videophones and total conversation terminals⁶. NFTH consists of representatives from national telecommunication agencies, suppliers and national institutes for technical aids for the disabled in Sweden, Norway, Denmark, Finland, Iceland and Greenland. By agreeing to use the same set of requirements for text and video terminals, the users in the Nordic countries can benefit from each other's experiences and from the fact that the suppliers will have a broader market to provide terminals to.

The guidelines from NFTH and the corresponding Swedish requirement specification are documents which will require updating at a regular interval, since the pace of product development is very fast.

http://www.hi.se/templates/Page____806.aspx (English version).

The guidelines issued by The Nordic Forum for Telecommunication and Handicap can be found at www.nuh.fi/nfth.htm.

⁵ ITU-T V.21 (1988), International Telecommunication Union

⁶ Guidelines – Total conversation units, text phones and videophones (NFTH 4/2006), http://www.nuh.fi/NFTH_2-2005.pdf