



2 Reports from National Contact Centres

2.1 Austria

Ruth Demuth

Institut für Allgemeine Elektrotechnik und Elektronik

Fortec – Working Group on Rehabilitation Engineering

University of Technology, Vienna

Gußhausstraße 25-27/359-3B

A-1040 Wien



2.1.1 *Methods of approach in carrying out the inventory*

Collecting information concerning addresses of organisations and societies who are working in the area of assistive technology came from these sources:

- Contacts to organisations and persons known by the Research Group on Rehabilitation Technology
- Searching in the web for possible addresses.
- Literature research
- The ÖAR - Österreichische Arbeitsgemeinschaft für Rehabilitation (Austrian working group of rehabilitation) offers an annual catalogue, the 'ÖAR Handbuch', of the most important addresses in the rehabilitation area.
- The BMAGS - Bundesministerium für Arbeit, Gesundheit und Soziales (Federal Ministry of Labour, Health and Social Affairs) has published a book, 'Österreich sozial', containing all addresses and telephone numbers of socially related offices, institutions and organisations.
- The Austrian Parliament
- etc.

The questioning was carried out by interviews. Each was supported by a special catalogue of questions where the answers were filled in. The use of questionnaires was disclaimed, because of problems like getting them back soon enough and the correctness of information.

The organisations were asked to send further information or advertising folders to support the description of their projects.

2.1.2 *Institutions, Organisations, Actors*

The names and addresses of the organisations asked in the inventory and additional ones are listed here:



2.1.2.1 Agencies

BSB Bundessozialamt and Social Service office

- Kärnten: Kumpfgasse 23, A-9010 Klagenfurt
- Oberösterreich: Gruberstraße 63, A-4010 Linz
- Salzburg: Auerspergstraße 67a, A-5027 Salzburg
- Steiermark: Babenbergerstraße 35, A-8021 Graz
- Tirol: Herzog-Friedrich Straße 3, A-6010 Innsbruck
- Vorarlberg: Rheinstraße 32, A-6903 Bregenz
- Wien,
Niederösterreich,
Burgenland: Babenbergerstraße 5, A-1010 Wien

Arbeiterkammern (in all nine counties of Austria)

2.1.2.2 Offices

Bundesministerium für Arbeit, Gesundheit und Soziales

(Federal Ministry of Labour, Health and Social Affairs)

Stubenring 1, A-1011 Wien

Phone: +43 1/71100-0

Magistrat der Stadt Wien - MA 12 Behindertenhilfe

(Help for disabled Persons offered by the town of Vienna)

Schottenring 24, A-1010 Wien

Phone: +43 1/53114-0



2.1.2.3 Schools

HTBLA, BHAK und BHAS Wien III
(commercial school for disabled students)
(Ungargasse 69, A-1030 Wien
Phone: +43 1/7131518-0)

BBI - Bundes-Blindenerziehungsinstitut
(school for blind students)
Wittelsbachstraße 5, A-1020 Wien
Phone: +43 1/ 7280866-0 or 7280483-0

Bundesinstitut für Gehörlosenbildung
(school for deaf students)
Maygasse 25, A-1130 Wien
Phone: +43 1/8046661 or 8046364

2.1.2.4 Centres of further education

BFZ- Berufsfindungszentrum
Geiselbergstraße 26-32, A-1110 Wien
Phone: +43 1/74022-0

BFZ- Berufsfindungszentrum
Am Sagacker 3, A-8605 Kapfenberg
Phone: +43 3862/25553-18

2.1.2.5 Standardisation offices

ON - Austrian Standards Institute (Österreichisches Normungsinstitut)
Heinestraße 38, A-1021 Wien
Phone: +43 1/21300-0



2.1.2.6 Universities

fortec - Research Group on Rehabilitation Technology

University of Technology Vienna

Gußhausstraße 27/359-3B, A-1040 Wien

Phone: +43 1/5041830-11

University of Linz

Institute of Informatics

Altenbergerstraße 69, A-4040 Linz

Phone: +43 732/2468-9232

2.1.2.7 Institutes and Research groups

Biomed & Rehab Seibersdorf

A-2444 Seibersdorf

Phone: +43 2254/780-2716

Ludwig Boltzmann Institut für technische Lebenshilfen

Inffeldgasse 18, A-8010 Graz

Phone: +43 316/465098

ISD - Institut für Soziales Design

Grenzackerstraße 7-11, Stg 19, A-1100 Wien

Phone: +43 1/6171159

2.1.2.8 Companies

CareTec

Wollzeile 9, A-1010 Wien

Phone: +43 1/5138081-0

Ing. Bernt Kopper Computer und elektronische Hilfsmittel

Geibelgasse 28, A-1150 Wien

Phone: +43 1/8941571



Dr. Wimmer

Währingerstraße 90/11, A-1180 Wien

Phone: +43 1/4703364-12)

Peter Tupy Gesundheitservice

Kirchenplatz 1, A-2353 Guntramsdorf

Phone: +43 2236/53766-0

POYET GmbH - Spezialist für Rehabilitationstechnik

Geiselbergstraße 26-32/Stg 4, A-1110 Wien

Phone: +43 1/7484242

REHA- Service Altenhof

Hueb 10, A-4674 Altenhof a. H.

Phone: +43 7735/6631-489

Vigele Nenad, Voice Creative DV

Im See 33, A-2122 Ulrichskirchen

Phone: +43 2245/6302

2.1.2.9 Unions

*Service und Informationsstelle für Gesundheitsinitiativen und Selbsthilfegruppen
SIGIS im Fonds "Gesundes Österreich"*

Ausstellungsstraße 44, A-1020 Wien

Hilfsgemeinschaft der Blinden und Sehschwachen Österreichs

Treustraße 9, A-1200 Wien

Lebenshilfe Österreich

Schönbrunner Straße 179, A-1120 Wien

Österr. Blindenverband

Hägelingasse 4-6, A-1140 Wien

Österr. Gehörlosenbund

Waldgasse 13, A-1100 Wien



Österr. Gesellschaft für Muskelerkrankte

Währinger Gürtel 18-20, PO Box 23, A-1097 Wien

Österr. Hilfswerk für Taubblinde und hochgradig Hör- und Sehbehinderte

Stumpergasse 43/2/R4, A-1060 Wien

Österr. Multiple-Sklerose-Gesellschaft

Univ. Klinik für Neurologie

Währinger Gürtel 18-20, A-1097 Wien

Verband aller Körperbehinderten Österreichs

Lützowgasse 24-26, A-1140 Wien

Verband der Querschnittgelähmten Österreichs

Secretary: Sahulkastraße 3/Stg9/R10, A-1100 Wien

2.1.2.10 Federations

SAFORT - Verein zur Förderung sozialer Arbeit, Fortbildung und Forschung

Czerningasse 12/14, A-1020 Wien

ÖV-BAuWK –

Österr. Verein für bürospezifische Anlehre und Weiterbildung für Körperbehinderte

Benedikt-Schellingergasse 10/19, A-1150 Wien

Bürowerkstatt - Verein zur Förderung der beruflichen Integration Behinderter

Längenfeldgasse 13-15, A-1120 Wien

2.1.2.11 Barrierfree constructing

ARGE Österr. Forschungsinsitut für behindertengerechte Umweltgestaltung

Mrs. Ing. Christa Goetzloff

Ebelsberger Schloßweg 1, A-4030 Linz

Beratungsstelle für blinde und sehbehinderte Menschen, Odilien Institut

Leonhardstraße 130, A-8010 Graz

Fachstelle der Stadt Wien für barrierefreies, behinderten- und generationsgerechtes

Planen, Bauen und Wohnen



MA 12, Ing. Peter Groiss, Ocwirkgasse 3/8, A-1210 Wien

Forschungsinstitut für Orthopädiotechnik

Abt. Bauberatung

Mr. Ing. Johann Ziegler

Geigergasse 5-9, A-1050 Wien

Institut für soziales Design

Mag. Dieter Berdel, Mag Peter Pruner

Grenzackerstraße 7-11, Stg 19, A-1100 Wien

Mobilitäts-Forschungsinstitut

Mr. Mag. Ing. Peter Weiler-Haditsch

Mentlgasse 12A, A-6020 Innsbruck

Österreichische Arbeitsgemeinschaft für Rehabilitation ÖAR

Mr. Eduard Riha

Stubenring 2/1/4, A-1010 Wien

2.1.2.12 Institutional help organisations

BBRZ - Berufliches Bildungs und Rehabilitationszentrum Linz

Grillparzerstraße 50, po box 343, A-4021 Linz

RISS - Rehabilitation und Integration Sehbehinderter und Späterblindeter Linz

Grillparzerstraße 50, po box 343, A-4021 Linz

Österreichisches Hilfswerk, Bundesgeschäftsstelle

Reichratsstraße 11/5/20, A-1010 Wien

Österreichische Gesellschaft für Arbeitsassistenten OeGA

Alserstraße 23/12, A-1080 Wien

Arbeitsassistenten für Gehörlose and WITAF - Wiener Taubstummen Fürsorgeverband

Kleine Pfarrgasse 33/2. Stk., A-1020 Wien

Elisabethinum - Förderzentrum für körper- und mehrfachbehinderte Menschen

Mailsweg 2, A-6094 Axams



Arbeitstrainingszentren

Obere Straße 45, A - 3553 Schiltern; Wienerstraße 266, A-4030 Linz

Bunte Rampe - Beratung und Hilfsmittel für selbständiges Leben behinderter Menschen

Kalvariengürtel 62, A-8020 Graz

Bandgesellschaft - Österr. Hilfswerk für Behinderte und Schutzbedürftige

Thaliastraße 68/3/6, A-1160 Wien

2.1.3 *Methods and Experiences*

2.1.3.1 **R&D/ AT Contacts**

2.1.3.1.1 *Sites at Universities where R&D is done*

In the projects at the **Research Group on Rehabilitation Technology** (University of Technology, Vienna) users are integrated in the whole process of development. Two examples, the projects AUTONOMY and POVES, will describe the way the users are involved in the development there (see 3.1.1 and 3.1.2).

Dr. Wolfgang L. Zagler

DI Paul Panek and DI Peter Mayer

Institute für Allgemeine Elektrotechnik und Elektronik

University of Technology

Gußhausstraße 25-27/359/3B, A-1040 Wien

Phone: +43 1/504 18 30-11

At the **University of Linz** blind students is offered special support and equipment. It was the first attempt in Austria to invent 'Computer Science for the Blind' at a university (see 3.1.3).



Mag. Klaus Miesenberger
University of Linz
Altenbergerstraße 69, A-4040 Linz
Phone: +43 732/2468-9232

2.1.3.1.2 *Institutes where R&D is done:*

The **Boltzmann Institute for assistive Technology** (Boltzmann Institut für technische Lebenshilfen) in Graz works at the project 'eye-writer' (see 3.1.4).

DI Erika Lileg
Ludwig Boltzmann Institut für technische Lebenshilfen
Inffeldgasse 18, A-8010 Graz
Phone: +43 316/465098

The **Biomedical Engineering and Rehabilitation Engineering Centre** in Seibersdorf developed a project called 'Step by Step' (see 3.1.5).

Dr. Krocza, Biomed & Rehab Seibersdorf
A-2444 Seibersdorf
Phone: +43 2254/780-2716
<http://biomed.arcs.ac.at/>

The **ISD - Institute for Social Design** (Institut für Soziales Design) developed 'modus med' - an ergonomic chair for elderly persons in cooperation with Wiesner-Hager, a furnishing house (see 3.1.6).

Mag. Peter Pruner
ISD - Institut für soziales Design
Grenzackerstraße 7-11, Stg 19, A-1100 Wien
Phone: +43 1/6171159



2.1.3.1.3 *Enterprises where R&D is done*

CareTec Corporation, an enterprise situated in Vienna developed:

NotaPhone - a portable electronic wordprocessor with speech output and ColorTest - color detector with speech output (see 3.1.7 and 3.1.8).

Wollzeile 9, A-1010 Wien

Phone: +43 1/5138081-0

2.1.3.1.4 *Enterprises working in the area of 'AT':*

The **ORF** (Austrian Broadcasting Corporation) offers teletext - subtitles and special teletext-pages for hearing impaired persons (see 3.1.9).

Würzburggasse 30, A-1130 Wien

Phone: +43 1/87878-3453

Dr. Wimmer, project: 'atlas speaks and strider'

Mr. Neuber, Währingerstraße 90/11, A-1180 Wien

Tel: +43 1/4703364-12 (see 3.1.10)

Ing. Bernt Kopper , project: communication-tool

Mr. Ing. Bernt Kopper, Computer and electronically aids

Geibelgasse 28, A-1150 Wien

Phone: +43 1/8941571) (see 3.1.11)

Voice Creative DV, project: IBIS - product information system

Mr. Vigele Nenad, Voice Creative DV

Im See 33, A-2122 Ulrichskirchen

Phone: +43 2245/6302

<http://www.cta.at/cta> (see 3.1.12)



2.1.3.1.5 *Enterprises adapting systems:*

Peter Tupy Gesundheitservice

Kirchenplatz 1, A - 2353 Guntramsdorf

Tel: +43 2236/53766-0 (see 3.1.6)

POYET GmbH - Spezialist für Rehabilitationstechnik

Geiselbergstraße 26-32/Stg 4, A-1110 Wien

Tel: +43 1/7484242 (see 3.1.6)

REHA- Service Altenhof

Hueb 10, A-4674 Altenhof a. H.

Phone: +43 7735/6631-489 (see 3.1.6)

2.1.3.2 **User participation in R&D and related issues**

2.1.3.2.1 *Project AUTONOMY - A Technical Assistive System*

AUTONOMY is a technical assistive system for motor- and multiple impaired persons. The investigation of technologies supporting the independence and self-determination of motor- and multiple impaired persons in the home-environment has been continued in the following way:

In the theoretical approach, the work started with an investigation of user-needs and the state-of-the-art. The analysis led to an innovative concept, called the "Technical Assistive System". Main characteristics of this concept are:

- Integration of all functions and services into one system, controlled via one user-interface.
- The multi-modal user-interface is highly flexible and can be set up individually for each user.
- After completion of the technical installation, the set-up and maintenance of the user-interface can be done at any time by a non-technician.



This concept calls for special tools to support the three involved user-groups: end user, facilitator and integrator.

In the constructive approach, a Technical Assistive System was developed in co-operation with Legrand Österreich Ges.m.b.H. This system — called "AUTONOMY" — supports the following functions: remote control of nearly every electrically controllable device, alternative and augmentative communication (for speech- and language impaired persons), general computer access and security/safety.

In the experimental approach, a test-apartment in a support centre for motor- and multiple impaired persons was equipped with the AUTONOMY-System to support independent living and self-determination. The evaluation is done in co-operation with occupational therapists, physicians, technicians and persons with disabilities in order to verify if the developed concept is able to reach its goal: to contribute to the autonomy of people with special needs in daily life.

- Problem definition: before the start of the project a demosystem was installed and presented to possible users, care giving persons, technicians and specialists of therapy, medicine and pedagogic. Together they defined the hypothetical ideal model of a technical assistive system. The demosystem showed all participants, not only to the technicians, a concrete image of the technical possibilities.

During this meeting the main demands were defined. These requirements were used in the next step and built the basis for the specification.

- Analysis/specification: for analysing the duty catalogue and the specification of the prototypes the user was interactively involved. The testpersons had to check the system for suitability under real conditions. These results and additional suggestions of the users were used to change the system concept.
- Development: during the system development the testpersons were informed about the state of the process. They took part of development because of their comments to the relevant parts of the system.



- Testing: the validation of the AUTONOMY-system took place in a test-apartment in the "Elisabethinum" (Förderzentrum für körper- und mehrfachbehinderte Menschen), a support centre for motor- and multiple impaired persons which was equipped with the AUTONOMY-System to support independent living and self-determination. Ten seriously handicapped tested the system. The evaluation was done in co-operation with occupational therapists, physicians, technicians and children and juveniles with disabilities. The contact between the persons at the testsite and forttec was very close. Experience reports were sent to forttec by email, in meetings suggestions to improve the system were discussed together.

2.1.3.2.2 *Project: POVES - Portable Optoelectronic Vision Enhancement System*

POVES is an optoelectronic device for nightblind users. POVES will ease visual impairments, e.g. night blindness, decrease of the visual field, colour blindness and impairments in contrast perception, light sensitivity and visual acuity, which cannot be compensated by conventional optical means.

Principle of the POVES Device:

POVES is a battery operated, portable image processing system, consisting of a head worn spectacle part carrying cameras and screen displays and a pocket part containing the image processor, the power supply and the controls (user interface).

As a first step a system for night blind persons was built. This system runs under the acronym NiViS (Night Vision Spectacles). The other classes of visual impairment will be implemented in a following project.

POVES was an EC-project. Within this project forttec was responsible for defining the needs of the disabled users and for performing tests with the different systems.

- Problem definition: during the process of defining the project, some people, representing disabled users, were integrated
- Analysis/specification: the users were not directly involved in the analysis, but they contributed to the specification process via their ophthalmologist.



- Development: there was no user involvement during development
- Testing: nightblind users tested the spectacles of NiViS, the results gave the feedback to a redesign

2.1.3.2.3 *Project: Computer Science for the Blind*

In 1991 the Institute for Computer Science at the Johannes Kepler University in Linz planned to support visually impaired students in a technical and in a pedagogical way. By means of new computer technology (Computer Science for the Blind), the Educational Endeavour tries to facilitate a university curriculum under equal conditions and in the same time as for the sighted students. Presently, courses in General Computer Science, Computer Science for Economists, Law, and a special preparation course for students without university qualification are attended. It is planned for the future that, by the use of our technical, pedagogical and social know-how, the entire educational scope of the university shall be accessible to the visually impaired.

New technology opens independent and efficient access to information to the visually impaired and, therefore, also to teaching materials. At the Educational Endeavour, this technology is available, is trained by special courses, and is maintained: 3 fully equipped workplaces (IBM compatible PC's), 1 Macintosh workplace and one portable workplace are available. They are linked into a local area network, which by itself is connected to the university LAN and, therefore, has a gateway onto international networks. Two screen enlargers, one swell paper copying machine, and two printers (one for normal print and one for Braille) supplement the equipment.

The main part of the support activities is the digital preparation of all studying materials by tutors who are students in an advanced semester. Materials that are already obtainable in digital form are converted to a format suitable for the visually impaired. Materials available in printed form are processed by a scanner.

During the project 50% of all tasks are done by blind and visually impaired and 50% by sighted persons. The guideline of integrating persons with a visual handicap in



every step of the project and dividing the work on both groups (sighted and blind persons) goes through the whole process of the project. Actually there are three sighted and three visually impaired or blind persons working at the institute.

- Problem definition: the idea of this project came from afflicted persons. The problem definition was done by them in co-operation with the staff at the institute.
- Analysis/specification, development and testing: was done 'fifty fifty' by sighted and visually impaired or blind persons.

2.1.3.2.4 *Project: eye-writer*

Eye-writer is a communications-system for mobility impaired persons, which allows them to communicate via Computer and lead a more independent life. The light potential differences of the eog near the eye are measured and so the visual angle of the eye can be exactly defined.

The results of the eog-measuring get amplified and pre-processed and are finally transformed to signals for steering a commercially used, cable-less mouse. To realise a mousecompatible output to the computer it is necessary to get an application-independent insertion in the operating system so as to see the eye-writer a an extended mousedriver.

This allows steering of the mousecursor on the screen of a computer by the movements of the eye. With buttons on the screen functions can be selected, which allows to use all standard software where input via mouse is possible. Another possibility is to use software-steerable devices, e.g. radio, video, door-opener, etc., with the eye-writer.

- Problem definition: together with handicapped persons
- Analysis/specification: no disabled persons were integrated
- Development: no disabled persons were integrated
- Testing: together with handicapped persons



2.1.3.2.5 *Project: Step by Step*

The system 'Step by Step' includes hard- and software to assist the process of learning with handicapped children. It serves teachers and therapists as flexible, extendible tool. Phase 1 of the system aims in particular at children in the pre-school age (up to six years). The children get used to the computer and are guided through the modules in order to improve their logic and linguistic skills as well as their physical co-ordination.

Phase 2 is also used for the teaching of primary school issues. Through means of saving program-sequences an environment is created for the children that they can get used to easily. A set-up module gives the possibility to the therapist to configure the system individually. Special interfaces provide for the integration of several input devices (off the shelf products as well as custom specific devices). The graphical user interface is designed with respect to an intuitive and easy program control. Special emphasise has been put on easy installation and usage, also for people without technical skills.

Step by Step consists of hard- and software to assist the process of learning with handicapped children. During the whole project the developers worked together with organisations for handicapped persons, the SPZ - Sonderpädagogisches Zentrum (Centre for special education) Herzogenburg and the 'Institute Keil'. Therapists and handicapped children were involved too.

- Problem definition: was done by the developing team together with organisations for handicapped persons and therapists.
- Analysis/specification: during this phase of the project only the therapists were involved and asked for their knowledge.
- Development: the development itself was done with consultation of organisations for handicapped persons, handicapped children and their therapists.
- Testing: handicapped users (children and their therapists) were involved as testpersons.



2.1.3.2.6 *Project: modus med*

In the project 'modus-med' the ISD - Institute for Social Design (Institut für Soziales Design) developed an ergonomic chair for elderly persons in Cupertino with Wiesner-Hager, a furnishing house.

The ISD was responsible for the ergonomic part of the design and had to keep contact to the users. At the beginning of the project there a questioning of elderly and handicapped persons was done. Already existing chairs were tested and criticised by the users. The participants in the usergroup were asked for their demands to a suitable chair. Different kinds of user groups had the possibility to state their ideas and wishes. The results of the interviews were collected and published in a paper of demands.

The designers of the furnishing house made several prototypes and compared them with the paper of demands. Some conflicts arised, because the artistically design contradicted in some areas with the demands of the user. Finally the ergonomic guidelines were integrated in the final design.

- Problem definition: the users and the IDS were integrated in the process of problem definition.
- Analysis/specification: the users' opinion was represented by the IDS.
- Development: the ISD plead for the ergonomic aspect
- Testing: because of lack of time there was no possibility to let the user test the final version of 'modus-med'

2.1.3.2.7 *Project: NotaPhone*

NotaPhone is a portable electronic wordprocessor with speech output.

Blind persons are often constraint by reading and writing equipment which is bulky and difficult to transport. Although most braille writing equipment is portable when compared with mechanical braille writing devices, there is a need for miniaturising.



NotaPhone consists of a braille keyboard for text entry, ROM and RAM storage, an RS-232 interface and a speech chip. Information which is entered through NotaPhone's keyboard can be edited or sent to an external computer for further text manipulation or permanent storage. It can also be output to an inkprint or braille printer. NotaPhone can be used as a talking terminal.

NotaPhone 'speaks' German in full sentences, it has a comfortable editor which allows the user to manipulate text in much the same manner that a PC user would. Single characters or larger texts units can be inserted, deleted, moved or copied.

Other features are: a pocket calculator (a basic and a scientific calculator), a speaking clock, stopwatch, alarm clock and appointment calendar, a database for names, addresses and telephone numbers, etc.

- Problem definition: the problem itself was mentioned by blind persons, the problem definition was worked out in a team of a few blind persons and the technicians.
- Analysis/specification: no users were involved
- Development: there was no user involvement during development
- Testing: during this period many blind persons tested the system in different vocational and private environments. The people who bought it worked as a kind of 'beta-tester'. The results of the tests caused changes and new versions.



2.1.3.2.8 *Project: ColorTest*

ColorTest is a handheld color detector with speech output.

A critical factor in determining the difference between two objects which are otherwise similar is color. When other factors permit, blind people can live very independently. Independence, however, is sometimes decreased through an inability to recognise, e.g. the color of two similar packaged types of milk or the color co-ordination of clothes.

The goal of this project was the development of a probe which will communicate the color of an object to a blind person through synthetic speech. This is accomplished by focusing white light onto the object in question and measuring the color components (red/green/blue) of the reflected light with an integrated three-color-sensor.

A battery-powered prototype using speech output has been developed. The unit can reliably detect and accurately determine ten color types and associate shades of bright, medium and dark.

- Problem definition: the idea for a tool like the ColorTest was mentioned by blind users. Some of them assisted in the process of defining the problem.
- Analysis/specification: no users were involved
- Development: there was no user involvement during development
- Testing: many blind persons tested the system.

2.1.3.2.9 *Project: Teletext - Subtitles*

Since 17 years the ORF (Austrian Broadcasting Corporation) offers subtitles in television for hearing impaired persons. The subtitles are a part of the teletext. The ORF has also special teletext-pages for the deaf.



In the staff for creating subtitles are no hearing impaired persons. Most of the information is on tapes and gets processed from them. In the teletext staff is a deaf woman who is handling a teletextpage for deaf persons.

The main problem of preparing subtitles is that the different kind of deaf people need different subtitles. The content of text depends on the age when the persons became deaf and on the kind of program they want to watch. It is a matter of speed, degree of difficulty and depends also on the kind of tv-programme.

Some people want more information, usually the ones who became deaf rather late, some need very simple texts. For persons who became deaf very early the texts have to be simplified. Subtitles for children are different than the ones for adults, films with subtitles for children are often used during lessons at schools for deaf pupils.

The staff for teletext subtitles at the ORF is working together with the broadcasting corporations of Germany and Switzerland, by exchanging subtitles and know-how. They keep contact to associations of the hearing impaired and try to be informed about new developments by visiting conferences.

Getting feedback from the user is important. The suggestions are collected, discussed and changes are integrated in the system.

At the teletext-page for the deaf the user can suggest to invent subtitles for some transmissions they would like to read. Another page, called "reading instead of listening" ("lesen statt hören") is invented for these users.

- Problem definition: hearing impaired persons took part in the definition phase
- Analysis/specification: there was no user involvement
- Development: during development the deaf people were represented by the association of the deaf
- Testing: deaf readers are testing and suggesting changes.



2.1.3.2.10 *Project: atlas speaks and strider*

This project is a navigation system for blind persons. The development was done by an American enterprise (Arkenstone) and was adapted for Europe by the company of Dr. Wimmer, e.g. the speech output had to be changed into German. In Austria the system was presented at a fair in Vienna, it was shown how to get along with it in the urban area of Vienna.

The project consists of two parts:

1. 'atlas speaks': a route planning system, running on a computer, developed especially for blind persons.
 2. 'strider': this part of the system needs as input the data from the route planning system, combines it with GPS and delivers the necessary information as speech output.
- Problem definition: in the definition of the project and in the adaptation for Austria blind persons were integrated.
 - Analysis/specification: done by Arkenstone, but with assistance of blind people
 - Development: the user was involved in the development too
 - Testing: blind users tested the system, the changed system was tested in Austria by blind persons too.

2.1.3.2.11 *Project: communication - tool*

Mr. Ing. Bernt Kopper, firm: Ing. Bernt Kopper Computer und elektronische Hilfsmittel (Computer and electronically aids)

1987 a severe mobility impaired person initiated the project "communication-tool". The output of a pulse generator (e.g. eyelid switch) was transmitted to a Commodore 64. The commands were analysed and used to handle a second Commodore 64. By this way mobility impaired persons could handle a Commodore 64 'normally'.



In a later version the system was changed from using two Commodores to using two PCs. A software-simulation of the keyboard was developed, which worked as usual input for the keyboard of the second PC.

Beside the eyelid switch, there can also other input devices be used to handle the computer. The target group still consists of severe mobility impaired persons.

the idea to develop a communication-tool for mobility impaired persons came from a spastic person, who was not able to handle a keyboard. He had influence on the development and assisted and tested during the whole project.

- Problem definition: the definition of the project was done by a mobility impaired person and the technicians.
- Analysis/specification: the initiator of this project was assisting in analysis and specification too.
- Development: the user was involved in the process of development
- Testing: some users tested the system

2.1.3.2.12 *Project: IBIS - product information system for blind persons*

Mr. Vigele Nenad, firm: Voice Creative DV.

IBIS is a product information system for blind persons which works by telephone. The selection of certain rubrics works via telephone number. After dialling the list of products is read aloud and the user can select which part he wants to hear in detail.

The owner of this firm, who is also developing the system, is blind. Beside him other blind persons are testing the product. Therefore in all steps of developing the aspect of a blind user is guaranteed.

- Problem definition: the future user is integrated
- Analysis/specification: blind persons are involved
- Development: there is user involvement during development
- Testing: blind persons are testing the system



2.1.3.2.13 *Project: REHA- Service Altenhof*

The products of the REHA-Service Altenhof are wheel-chairs, lifts, care-beds, medical supply, equipment of nursing-homes and everyday care.

Beside selling, service and repairing they are adapting products for users. The electric wheel-chairs get a specific steering depending on the problems the handicapped person have. The technical equipment is adapted to the users abilities, i.e. the user is involved in the process of adaptation.

2.1.3.2.14 *Project: Peter Tupy Health-service ("Gesundheitservice")*

The products of the Peter Tupy Health-service are walking-aids and electric vehicles.

The main task is selling the products, but they also do changes and adaptations of the systems if it is necessary for the user.

2.1.3.2.15 *Project: POYET GmbH*

The products of the POYET GmbH are wheel-chairs and perambulators (baby carriages).

They advice customers and sell products. The wheel-chairs and perambulators get adapted to the persons who will use them and in a final test the changes are controlled.

2.1.3.3 **User Participation in Standardisation Work and in Comparative Testing by Testing Agencies**

2.1.3.3.1 *Austrian Standards Institute (Österreichisches Normungsinstitut).*

Standards are one of the basic instruments to manage increasing complexity. The Austrian Standards Institute ON is the managing and organising standardisation activities in Austria. As a non-profit service organisation (founded in 1920) based on the Standards Law its main task is to assure that technical rules (standards) required by economy and administration be prepared according to internationally agreed principles. The preparation and publication of such technical rules represent a



substantial contribution to the provision of an economic and ecological framework for economy and administration and, therefore, to the benefit of the entire community.

The technical officers of ON are responsible for the functioning of more than 200 Technical Committees, their subcommittees and working groups with over 7.700 members participating on a honorary basis.

In addition, ON has assumed responsibility for the co-operation of Austrian bodies with some 270 Technical Committees of the European Committee for Standardisation CEN and approximately 180 Technical Committees of the International Organisation for Standardisation ISO, and keeps contact to all standards bodies world-wide.

Tasks and objectives of ON

According to its Statutes and Internal Regulations, the ON has the following tasks:

- Preparation of Austrian Standards (ÖNORMEN) including the organisational infrastructure necessary for this activity .
- Organisation of the participation in the standards preparation procedure by regional (European) and international standards bodies according to their statutes.
- Co-operation with national, foreign and international organisations having the same or similar objectives or dealing with questions relating to standardisation.
- Publication and distribution of Austrian Standards, as well as of foreign, European and International Standards, other technical rules and pertinent documents.
- Implementation of foreign, regional or international standards and publications.
- Public relations activities as concerns the application and implementation of standardisation and the products thereof.
- Information and services related to the application and implementation of standards and technical rules.



- Promotion and implementation of activities in the field of conformity to standards.
- Teaching and training in the field of standardisation, application and implementation of standards and technical rules as well as domains related to standardisation.
- Implementation of all items according to the requirements of the Standards Law.

Principles of standardisation work

The preparation of standards on a national, European and international level requires a series of principles which warrant their general acceptance and practicability. These are as follows:

- Openness (Involvement of all stake-holders)
All interested parties can and shall participate in standardisation.
- Consensus
General agreement, no sustained opposition to substantial issues, due consideration of the opinions of all parties concerned and clarification of conflicting arguments. Austrian Standards are always adopted unanimously.
- Transparency
Each draft standard undergoes a public vote procedure. Justified objections have to be taken into account by the respective TC.
- Coherence
The standards collection shall be coherent (i.e. standards shall not be conflicting).



Committees assisting the disabled

The **technical committee FNA 196** (Fachnormenausschuß), called "technical aids for handicapped persons" (Technische Hilfen für behinderte Menschen), consists of the following subcommittees and working groups:

- AG 196.01: care and mobility aids ("Pflege- und Mobilitätshilfen")
- AG 196.04: vehicles for handicapped persons ("Behindertenkraftfahrzeuge")
- AG 196.06: aids for blind persons ("Blindenhilfsmittel")
- AG 196.10: computerbraille ("Computerbraille")

The **technical committee FNA 011** (Fachnormenausschuß) for building construction ("Hochbau") is responsible for the **B 16000**, the standard for barrierfree building.

The **SA 1004** (Sonderausschuß), called "handicap", is a special committee in the Austrian Standards Institute, where all committees and working groups are coordinated, their information is collected and their results are compared. The different standardisations are examined to prove that there is no conflict with other standards. E.g. the SA 1004 criticised a planned standard for beds because it did not take into account disabled persons using the bed. The standard was adapted.

In other committees, not related to the FNA 196, the matter of handicapped persons is represented by members of SA 1004. They can enter a protest and invite handicapped experts to the next meeting.

Participants of the meetings:

The participants of the working groups at **FNA 196** are handicapped and not handicapped persons. About a quarter or a third of the participants of the working groups are handicapped. At the meetings there are also representatives of interests, e.g. the association of the deaf-blind. There is a big influence of the disabled participants in the meetings.

Mobility impaired persons (wheel chair drivers) and blind and visually impaired persons participate at (all) standardisation meetings. Hearing impaired or deaf persons do not participate, a possible explanation might be that the loss of speech is



more serious than the loss of sight. An example: at the meeting on 9/97: two wheel chair drivers, three blind persons, one visual impaired person,...

Some participants at the **SA 1004** are handicapped. The SA 1004 invites experts to meetings, where the aspect of disabled persons is not clear. These experts are handicapped persons or representing them.

2.1.4 *Overview about User Training*

Austrian Standards Institute

The Austrian Standards Institute has no special user training like 'how to do standardisation work', but several attempts to ease the problems of disabled participants. Information is presented in a way that persons with impairments do not have disadvantages. Blind and visual impaired persons, invited to a standardisation meeting, get the documents before the meeting, they are in braille or sent by e-mail. At the meetings reading systems are available. Access to the meeting rooms is possible for wheelchairs.

2.1.5 *Overview of Organisational Frameworks for User Participation*

2.1.5.1 **Political area**

All political parties in the Austrian Parliament have a person who is responsible for handicapped persons, but only the speaker at the 'green party' is a handicapped person: Mrs. Theresia Haidlmayr. She is member of parliament and tries to be in the important committees and cares for integrating handicapped persons in working groups where the issues of disabled are discussed. Mrs. Haidlmayr is member of the movement, which says that handicapped persons should take care of the matter of the disabled and not be represented by other, not handicapped persons.

After submitting a petition a hearing was held where the political parties set in handicapped experts. This led to the setting-up of a working group to prepare a law of anti-discrimination of handicapped persons. Among the participants of this group are disabled persons.



In the committees of the Austrian Parliament handicapped persons are integrated and represent the disabled.

2.1.6 *Summary of Findings*

Regarding the fact that Austria is a rather small country the attempts to do R&D in the area of assistive technology for handicapped persons is big. Although a lot of firms concentrate on selling products from Germany, United states and other countries, there a some where development and even research is done.

In the R&D places the integration of handicapped persons in the process of developing and testing is done, the users have the possibility to change the systems until they fit their needs.