IMPROVING SOCIAL LIFE AND COMMUNICATION OF PEOPLE WITH DISABILITIES BY USING INTERNET FACILITIES

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Abstract: This paper presents some European initiatives developed within the Socrates Programme in order to support people with disabilities to use the new technologies. The disadvantages of the existing software designed for people with visual deficiencies together with some criteria that have to be considered in developing virtual learning applications for visually impaired are pointed out. The paper includes a proposal for improvement of the existing software for searching information and communication by people with disabilities, the first version of the FORThSIGHT Programme, elaborated in the framework of one Grundtvig 2 Learning Partnership.

Keywords: e-learning, new technologies

1. Introductory Aspects

The ability to obtain and use information about any subject gives people the opportunity to choose an alternative instead of being limited to a few numbers of choices that often does not fulfill their needs/wishes (Fullmer S., Majumder R. K., 1991).

In this context, in order to help people with disabilities, it is first necessary to have enough knowledge about both the information they need for daily life and work and their preference for sources of information. Secondly, it is necessary to help them to search and find such information by using suitable technologies like the Internet based on their interests. Thirdly, to avoid their social isolation, people with disabilities have to be helped to develop or join communities (also virtual ones by using the Internet and particularly the Web 2.0 with its social components). Internet is a global public space that must be open, affordable, and accessible to all (Kurtz Z., 2001). But the spread of Internet access takes place with uneven results and often makes social and economic inequalities deeper. However, Internet and other information and communication technologies (ICT) become increasingly powerful tools for social mobilization and development, resistance to injustices, and expression of difference and creativity. The ability of people (particularly of the ones with disabilities) to share information and to communicate via Internet is vital to keep human rights unaltered (Busse T., Hamburg I., 2006).

The aspects listed below are also explored within IECUVADVLA Grundtvig Learning Partnership (aimed at seniors with visual and hearing disabilities) and within the Grundtvig 1 project BASKI

(aimed at people with mental and multiple disabilities). They have been considered for the development of a software tool for information and communication of people with disabilities.

2. The use of the Internet for Information and Communication by People with Disabilities

Little is known about the broad spectrum of information needs for daily living and working of people with disabilities. Some studies (Williamson K., Schauder D., Stockfield L., Wright S., Bow A., 1998) found that the information needs of people with disabilities are likely to include (but not be limited to) service information, health, income and finances, recreation, accommodation. Results of some researches made within BASKI project indicated that people with mental and multiple disabilities are more interested in recreational activities than the rest of population is.

 Another aspect is represented by the strategies people use for finding information, strategies that are very different. This is also the case for people with disabilities. Circumstances of life (living alone or having a family, living in special houses, employed or not), the type of disability and individual preferences have an influence on these strategies. Knowledge about interests and strategies of people with disabilities are also important where attempts are made to encourage people to use new technologies like the Internet.

Internet and other online services based on Internet are seen as offering opportunities for everyone to participate in the information age and particularly benefits for people with disabilities helping them to have an "independent life". But cautions are expressed along with the enthusiasm about the value of the Internet for people with disabilities. As more and more people gain access to this space, many remain excluded. The spread of Internet access takes place with uneven results and often increases social and economic inequalities. The lack of suitable Internet functions, of software packages and adaptive equipment for the needs of people with disabilities contributes to this situation. The technological progress causes often human's isolation and alienation. Additionally, the lack of knowledge and skills of people with disabilities impair them in using and shaping the Internet to meet their needs.

Referring seniors, national studies developed within IECUVADVLA project showed that in some Eastern European countries seniors with visual and hearing impairments do not have free access to the Internet. The possibilities of acquiring and using necessary assistive technologies are restricted by their high cost. Many seniors are unemployed. As statistics showed, the highest seniors' unemployment rate registered last year in Eastern European countries was for a group with an average age of 42-54 years. Only a small number of people with visual and hearing impairments are institutionalized in centers of social assistance. A comparative report developed on the base of national statistics indicated that the highest percentage of institutionalized people with visual impairments was registered last year in Hungary, representing 3.51% of the total number of persons with visual deficiencies. This means that a large number of non-institutionalized people with visual deficiencies need to improve their social life and communication skills by using new technologies.

Research conducted within the two Socrates projects BASKI and IECUVADVLA showed that particularly older people wish to explore how the new technology can improve the quality of their lives. Some of them wish to transmit on the web traditions and customs to the new generation as a way of preserving the national identity. Social and cultural contexts influence people decisions about using particular communication technologies. People with mental and multiple disabilities as well as seniors with visual disabilities have difficulties of adaptation to new technologies when searching information for their life or for a job. One task within the two projects is to create and test short training courses for the two target groups according to their disabilities, interests, and age in order to facilitate the use of the Internet. Thus, courses on topics such as Internet basis, Search usual information, Culture in virtual spaces, How to communicate by using the Internet are in progress (see Figure 1). Another task is to try to improve the existing software for searching information and communication.
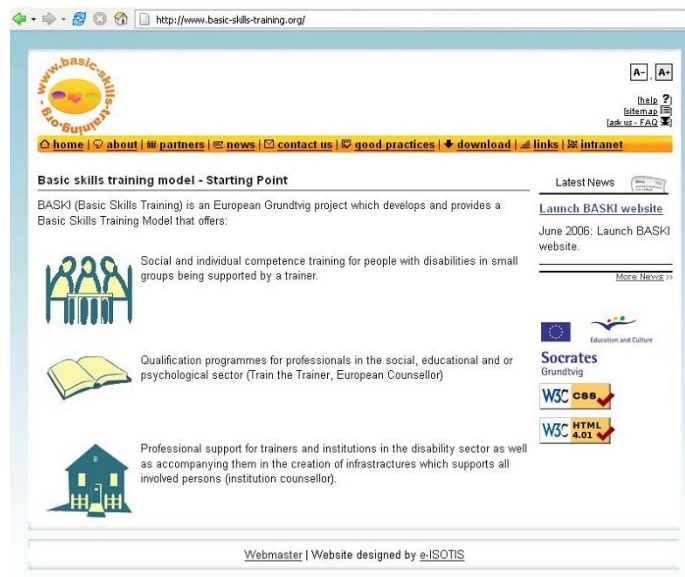
Figure 1: The main page of the BASKI Web-site.

3. Software for People with Disabilities

The worldwide software market offers several sorts of applications for visually impaired persons. In order to help visually impaired people to be well integrated in nowadays information society, the development of easily applicable computer peripheral devices was taken into consideration. Improvement of visibility and other senses aided information transfer (hearing and touch) can be realized by special systems, speech synthesizers or enlarging applications.

IMPROVEMENT OF VISIBILITY AND OTHER SENSUAL AIDED INFORMATION TRANSFER

Special systems   Speech synthetizers   Enlarging applications
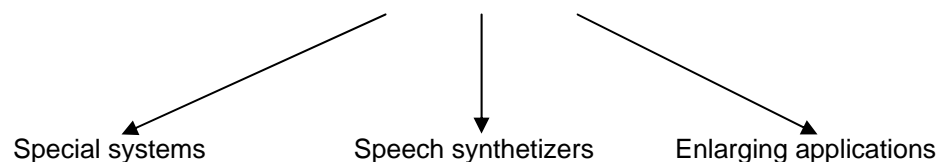
The typical realization of the special systems is the Braille display, but this is a solution mainly for blind people. The disadvantage of such special systems is their considerable high cost and the exclusive foreign serviceability. Because of these reasons, only a few special systems are used in Eastern European countries and only a fraction of them are owned by individuals. Speech synthesizers, the so-called screen readers, are the most widespread applications. The most significant disadvantages of the speech synthesizers are again their high cost and the technical problems that may occur. Most of these applications have only character mode as it is quite difficult to develop AI-s capable to recover textual information from graphical content. In fact, they can convert only texts into audio formats. With regard to enlarging applications, basically software-based solutions are concerned (such as MAGic, ZoomText) to enlarge a part of the screen to the desired rate (standard output). There are, though rare, other partially hardware-based solutions, like reading TV: a screen on a rolling tray that can be driven to two perpendicular directions is attached to a video camera placing the text in front of the video camera. Zooming can be switched to either negative or positive. Again the main disadvantage is the high price of these softwares and not necessarily due to the quality of the service but rather to the market's

gap. Also, most enlarging programs use a so-called rastergraphics technique based on pixels of the screen and on their geometrical arrangement, which is the etalon for the enlargement and not the mathematical vector formula. So in case of low quality monitors and small characters the outcome is dim and therefore useless.

Some versions of Microsoft Windows operating system have a built in screen magnifier application and several other such software are also available on Internet. All of them work with texts as a content of the screen, so that the written information is only a part of the actual screen-image. Additionally, all of them use bitmap (raster-graphical) file formats to store the screen prints, which means that when one wants to enlarge the image the quality of the readability might dramatically decrease, especially when the source text part of the screen was created with small fonts.

A new MS Windows based trend is spreading where MS programs are used as motors and separate applications based on them are developed for visually impaired. Unfortunately, this practice is implemented by only few companies.

Some aspects to be considered in developing virtual applications for visually impaired people are:
- people living with this disorder perceive information sometimes totally different than those with full eyesight;
- a good contrast is very important, dark background and light foreground, no background pattern (non ruled);
- motion picture is difficult to be watched because of quick visual frequency;
- when using figures simplified style is important, any decorations may disturb recognition;
- the size of the used font should be proportionate to its width;
- the user should be allowed to refit the size of objects on screen;
- a non-crowded text on screen is important;
- the mingling of fonts and the small size of them as well as different directons of writing can be disturbing;
- while watching from a short distance, the central visual field is greatly narrowed;
- information gathered from the Internet is usually processed off-line.

Also, in developing easy applicable computer devices for people with visual impairments, it should be taken into consideration that visually impaired children's precision movement develops very slowly and may cause troubles in using different devices, because starting, performing, and stopping a movement can be difficult for them. Eye-hand coordination is not perfect and the use of a mouse is more difficult. Consequently, it is advisable to slow down the mouse and it is mandatory to provide a proper keyboard navigation, which is a weakness of presently available enlarging softwares.

The first test version of the FORThSIGHT program was developed by Széchenyi István University from Györ, Hungary, in the framework of IECUVADVLA project. The program offers reading and writing facilities to people with visual impairments, making thus easier the use of Internet for Information and Communication.

The software package has been designed basicly for the products of Microsoft Corporation as a „read" (output function). This area includes the MS Office tools (Word, Outlook, etc.) and the MS Internet Explorer, MS Windows Notepad, Viewer as well.
The FORThSIGHT's main goal is to separate the text based informations retrieved from the aforementioned applications according to the user demands. This text can be easily resized and thumbed by simple mouse/keyboard controls.
The usability of FORThSIGHT's software consists of two main areas: the input ("write") and the output ("read") functions (see Figure 2).
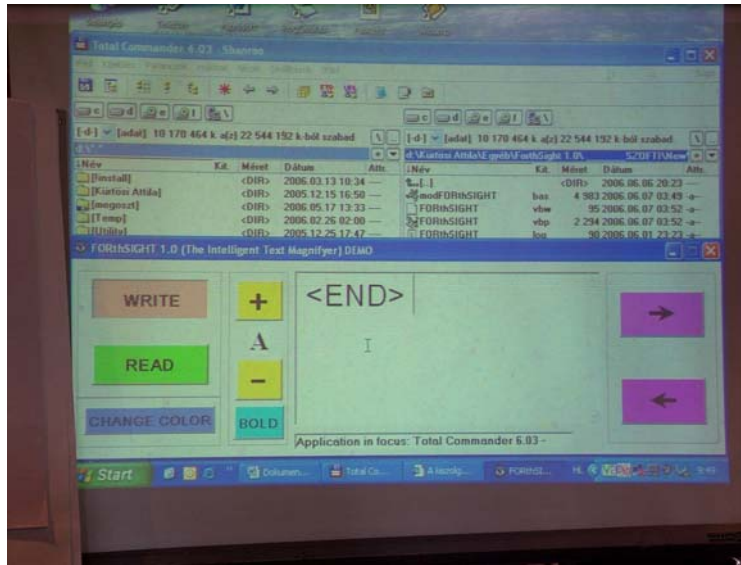
Figure 2: Write and read functions of the FORThSIGHT program.

With the help of this service all the keyboard events display on the FORthSIGHT's program window as a controll function with optional surface colour themes. There are also some other helpful options like the font size and the textbox foreground/background changing abilities or the "always on the top" and registry editing MS Windows facilities (see Figure 3).
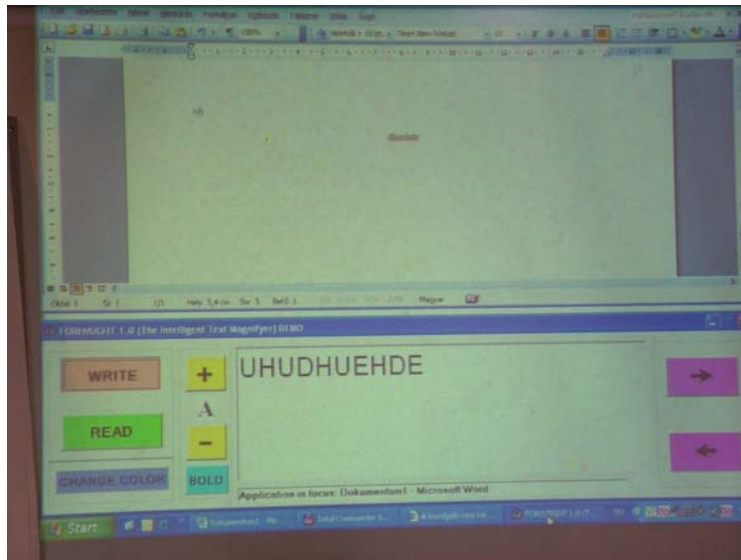

Figure 3: The first version of the FORThSIGHT Program.

The result of this research is a screen resolution independent software that is able to display sections of the given text format documents (website, .doc, .txt, etc.) in terms of topical font size set by the user with simple keyboard/mouse controls where both the write and read functions (I/O) are available. Thus, when a text is written with PC's keyboard the pressed keys are displayed in FORThSIGHT's application windows and when one would like to read a document file or e-mail or just browse the Internet the main text body appears with the FORThSIGHT, too.

The FORthSIGHT Program uses vector graphical system due to the font handling of MS Windows operating systems. Another advantage of the FORthSIGHT Program is its low price as

compared to other similar software products. The integrity of a MIDI based speech synthetizer in case of a successfull product launch is planned for further improvement.

4. Conclusions

Older people with disabilities must be encouraged to use the new technologies for the improvement of their lives' quality. The existence at a low cost of some softwares for information and communication of people with visual and hearing impairments would be a great benefit for people with such types of disabilities. In order to help trainers who are not familiar with the range of software available for people with impairments, some European initiatives in training teachers or cares in using software especially designed for people with visual and hearing deficiencies are required.

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