

9.

Using computer technology to empower the blind

1. GENERAL INFORMATION

1.1 Title of practice or experience

DosVox, DiscaVox and the InterVox Network: Using computer technology to empower people with visual disabilities

1.2 Category of practice/experience and brief description

DosVox, DiscaVox and the InterVox Network make use of simple computer equipment and appropriate software to generate work, study and social opportunities for blind persons in Uruguay.

1.3 Name of person or institution responsible for the practice or experience

Leo Pintos. Red InterVox

1.4 Name and position of key or relevant persons or officials involved

Leo Pintos is co-ordinator for the InterVox Network

1.5 Details of institution

- (a) Address: Ministerio de Educacion y Cultura, Area de Desarrollo humano Reconquista 535 piso 5, Montevideo, Uruguay
- (b) Telephone: ++ (598) (2) 915 6004, 915 0103 (ext. 151, 152)

1.6 Name of person and/or institution conducting the research

Alejandro Gomez, Third World Institute

1.7 Details of research person/institution

- (a) Address: Jackson 1136, Montevideo, Uruguay
- (b) Telephone: ++ (598) (2) 409 6192
- (c) Fax: ++ (598) (2) 401 9222
- (d) E-Mail: alej@chasque.apc.org

2. THE PROBLEM OR SITUATION BEING ADDRESSED BY THE PRACTICED INNOVATIVE EXPERIENCE

The marginalization of blind persons in any country presents a problem, but the situation is even worse in developing countries because of the lack of finances and sophisticated equipment, and cultural prejudices. In Brazil, where the DosVox software was first developed, several interfaces for the blind had already been created since 1970. There were then several blind persons who worked as programmers or system analysts with the help of such equipment. But it was very expensive – the cost of a very simple piece of equipment was over US\$3,000 – and therefore not adequate for general use. Even academic institutions and universities could not afford to possess such equipment, much less a blind individual for use at home.

3. DESCRIPTION OF THE PRACTICED INNOVATIVE EXPERIENCE AND ITS MAIN FEATURES

DosVox

“DosVox is a software package with utilities that give blind persons a chance to use a computer as a normal user by reading with a computer-generated voice what appears on the screen”. This is how the system was defined by its creator, Antonio Borges, a Brazilian professor of information technology at the Rio de Janeiro Federal University.

The system, which is being used by over a thousand persons in Brazil, was first translated into Spanish in Uruguay, in 1996. The Third World Institute, with the support of the Braille Foundation in Uruguay, developed the DosVox system for blind Spanish speakers in Latin America, who are estimated to number over 50,000. The idea was to develop a cheap technology, and make it available at a very low cost to disabled persons. The DosVox software is distributed free to people who need it and the hardware required to connect a computer without any sound capability to an inexpensive radio or tape recorder can be built for less than US\$100 in Brazil or Uruguay.

The system works in all kinds of computers running DOS. It has been

tested successfully even in **XT** and 286 models, which are frequently thrown away by individuals or corporations because of their being obsolete. Installation requires possessing the set of 10 diskettes containing the software, a voice synthesizer that connects to the printer port (the technology to build it is of public domain) and any sound device with a microphone or earplug standard connection (a common radio set or tape recorder would suffice). The **DosVox** software is made available with a printed manual and voice cassettes with step-by-step installation and operation instructions.

“For the common user, the computer must be as easy to handle as a radio set; that is why an explanation is given about what buttons to press and when,” says Borges. **If** the user is not familiar with the computer keyboard, the system itself teaches him/her by saying aloud which key it is that has just been pressed. The system allows the printing of text in a common printer or a Braille one. Written text can be lifted by means of a scanner which synthesizes it back into spoken form, so that it can be “read” by the blind.

DosVox and the Internet – DiscaVox

In order to provide for easy access to electronic mail, fax sending, access to newspapers, bibliographic research and file transmission, a special utility called **Disca (Dial) Vox** was created. It is also possible to have access to the World Wide Web by means of the public programme **LYNX**, which enables access to the text section of the pages.

This may seem a simple thing, and it is, but very few blind persons have read – or better still, have had someone else read to them – a printed newspaper. They often read books in Braille and they always listen to the television. One might point out that television and radio offer news, but it is news that comes as a package, where there is no possibility of choice, and one has to listen to everything, including what one does not want to listen to. On the other hand, written information is also usually more detailed.

DosVox thus incorporates a communications utility which makes it possible to send and receive faxes, keep an e-mail account with an Internet provider and have access to databases, newspapers, magazines and information published on the Internet. This access to communications via modem-fax guarantees free access to blind people to the Internet via the telephone line.

By means of **DiscaVox**, the idea is to link together a considerable number of blind persons and put them in touch not only among themselves but especially with the outside world, the world of those who can see. The cost is low for the user, since the communications service is given free, except **for** the use of telephone time.

Telecommunications are a reality of our time. The transmission of infor-

mation through telephone lines, linked to the international communications network (the Internet and others) that uses satellite technology, allows for the use of information in an instantaneous and transparent way, straight from the home, at reduced prices.

For the blind, access to information in networks enables them to read newspapers, send letters and receive fast answers, have access to videotext centrals, obtain direct access to bank accounts, take part in discussion lists, and other similar activities. This is extremely important: it means widening the cultural sphere that can be enjoyed by the blind.

“With the development of DosVox, a tool is brought into the hands of blind persons which is the most important one they can count on at the moment. This is not only because of all it enables us to do in terms of quick and simple handling of data with the word processor it includes, but also and most important, because of the chance it gives us to have access to the Internet, that major information source,” says Leo Pintos, the first DosVox user in Uruguay. It is also an important step towards integrating blind people in society, through their personal and professional growth. What is it that DosVox does? It makes it possible to process text, use a calculator, an appointment agenda or a telephone one, play, and, most important, have real access to the Internet and all its options: electronic mail, databases, WWW pages, conferences and teleconferences. “As a blind person who had access to the use of this programme, I can state that it is an enormous open window, and that it meant for me a big step into the formidable world of information and knowledge,” says Leo Pintos.

InterVox

With the development of information technology utilities which enable blind persons to have access to operating a computer, a new world opens up in terms of employment and education opportunities for people who have this type of disability. In this respect, the Ministry of Education and Culture in Uruguay, through its Human Development Department, is putting in place a National Network by and for blind persons. This Network at the moment consists of two Training Nuclei for the use of DosVox in Montevideo, and new nuclei are to be launched this year in several other departments of the country.

The first graduates of the DosVox system who have received their diplomas, are faced with the challenge of training other persons. Four young people of this first generation are already working as training staff at the Montevideo nuclei, and others will be doing training work in the new nuclei as they are started.

This Network, known as InterVox, is now being built day by day. It origi-

nated in the Electronic Computing Nucleus of the Federal University of Rio de Janeiro under the co-ordination of Professor Antonio Borges, with the collaboration of Professor Alberto Brusa in Uruguay.

4. DESCRIPTION OF THE INSTITUTION RESPONSIBLE AND ITS ORGANISATIONAL ASPECTS

The training of blind users in the use of DosVox and DiscaVox in Uruguay started as part of the activities of Chasque, a non-profit Internet service provider hosted by the Third World Institute in Montevideo and member of the Association for Progressive Communications. The demand soon overwhelmed the limited training facilities of Chasque and, through an agreement with the Culture Ministry, the training was moved to the premises of the Youth Institute. The initiative is based on borrowed equipments and voluntary work. The first trainees became trainers of new small groups, the size of which depends on the premises where the courses are held.

5. PROBLEMS OR OBSTACLES ENCOUNTERED AND HOW THEY WERE OVERCOME

DosVox itself solves most problems, since it does not require sophisticated equipment. The fast shift of the Internet into a graphics-oriented environment has created an additional difficulty in recent years, since DiscaVox requires an access provider that supports DOS users. In Uruguay, the problem of access in "text mode" was sorted out with the support of Chasque. Access to the World Wide Web is made possible by means of a mail server that sends Web pages (without images) to the user's e-mailbox. However, some pages become impossible to understand without the support of images. This problem thus requires a special awareness by the designers of the special needs of visually impaired persons.

Many blind persons have access to cheap computers but not to a telephone. In Brazil, the cost of a telephone line is very high: over US\$2,000. Bearing these cases in mind, a public DiscaVox has been installed in libraries and rehabilitation centres so that these people can have access to OCR technology (a scanner with Optical Character Recognition), Braille printing and the Internet.

6. EFFECTS OF THE PRACTICE/INNOVATIVE EXPERIENCE

The first graduates in Uruguay of the DosVox system that makes access to the Internet possible for blind persons received their diplomas on May 27,

in a ceremony presided over by the Minister of Education and Culture, Samuel Lichtensztejn.

With the support of the Ministry of Education and Culture, through its Human Development Department, courses are being held which imply that, at the moment, more than 50 blind persons are finding in DosVox an ally for working or studying.

In this respect, an expansion of the InterVox nuclei network is already in place, attempting to bring together all blind persons in Uruguay. The work carried out so far has yielded excellent results: two blind persons are now working for a telemarketing firm, operating on a level of performance equal to that of their fully seeing peers.

Users of the Internet who are members of Chasque Telematic Network navigate and keep in touch with the entire world searching for information or simple entertainment; university students, as well as secondary and primary school ones, improve their achievement with the use of DosVox, and public or private employees are promoted in their workplaces.

All this can be translated into a single expression: DosVox improves the quality of life for the visually disabled. The DosVox Program offers access to various Internet services: electronic mail, Web pages, teleconferences, etc. At present, more than 20 blind persons who have computers at home make use of and enjoy the advantages offered by computer technology in the fields of work, study, knowledge, entertainment and telematic communication without mediations with any other person in the world, thanks to the support given by Chasque Telematic Network to this initiative.

In pursuit of the aim of training those who are attending these courses that last about 30 hours, the next stage, now starting, is that of extending the InterVox Network to the rest of the country. The capital cities of the departments of San **Jose**, Paysand, Rocha, Florida and Maldonado will be the next locations where nuclei will be started. This means a considerable number of people will soon have access to training in the DosVox system.

DosVox has also had a considerable expansion in Brazil – there are, at the moment, over a thousand users, blind persons whose lives have improved thanks to the computer – and a big impact on the integration of the blind into society, opening new perspectives of study and employment. Because the cost of the system is so low, any company can buy it and employ a blind person in tasks such as teleshopping, for example. Students can read, write and be understood by their teachers and colleagues who do not know the Braille language.

7. SUITABILITY AND POSSIBILITY FOR UPSCALING

The DosVox system was made for common Brazilian blind persons, with dialogues exclusively in Portuguese, eliminating words in English or in over-technical language. The software has already been translated into Spanish in Uruguay, as it is adaptable to other languages using the Latin alphabet.

However, there is the need to develop it in a Windows environment. Work towards this end is being conducted in Brazil.

8. SIGNIFICANCE FOR (AND IMPACT ON) POLICY-MAKING

DosVox was created with Brazilian technology, a very low investment outlay and little complexity. And it has been adapted to the needs and difficulties of the Third World. The impact of the DosVox system in the blind community may easily be assessed by means of the comments in the written press, radio and television.

“We expect the dissemination of the use of DosVox will imply an important step towards turning the blind community in Brazil into an active, participating and producing group, which is integrated into society,” says Antonio Borges.

But DosVox is only a tool. In order for it to become really significant for the community, it is important that policies are implemented immediately that facilitate the integration of disabled persons into everyday life, as in the case in developed countries. It is hoped that the blind people who are using DosVox may set an example in the future to show society that the blind can be productive and useful human beings.

The integration of blind persons in society (employment, studying, ‘virtual’ communities) thus demands a change in policies for the training and support of these persons.

9. POSSIBILITY AND SCOPE OF TRANSFERRING TO OTHER COMMUNITIES OR COUNTRIES

The DosVox system is extremely replicable in other Third World countries for many reasons. Firstly, its low cost. The system has been industrialised, and now sells for under US\$100, including the cassettes that explain how to use it, the installation of the diskettes, the synthesizer and earphones. Including the cost of a second-hand PC 286 computer, which in Brazil is considered scrap, the total investment a family would have to make to give their blind child a computer would come to under US\$400. “Someone could argue that for Brazil this is a high figure,” points out Antonio Borges. “We agree,

but we are working towards encouraging companies who get rid of their old computers to donate them to blind students of low income”.

Secondly, the technology used is very simple. The source code, in Turbo Pascal, is distributed with the system in order to offer a resource for students who want to create technology for people with disabilities. In fact, by means of the use of the DosVox technology, important progress has been made in the rehabilitation of children with speech impairments.

Thirdly, the system uses international formulae. DosVox produces and reads data that may be processed by other common utilities for the blind.

And finally, the system can also be translated quite easily into any language using the Latin alphabet.

Developing the InterVox Network at the regional level constitutes a challenge. An ambitious project that will link the InterVox Networks in Brazil and Uruguay was started this year, with the participation of the Uruguayan Ministry of Education and Culture, the University of Sao Paulo, the Computing Nucleus of the Federal University at Rio de Janeiro, the National Research Network (Red Nacional de Pesquisa) at the Brazilian Ministry of Science and Technology, and REINTEGRA.

The challenge is to promote the initiative in all member countries of Mercosur (Argentina, Brazil, Paraguay and Uruguay), by means of building up Information and Communication Networks by and for disabled persons. The first stage of this Network for communication and information exchange about disabilities in the Internet, for Uruguay and Brazil, will be available at the end of 1998.