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GENERAL INFORMATION

Internet Banking Services for the visually impaired

Banco Bradesco
Osasco,
Brazil

Year: 1999
Status: Finalist
Category: Finance Insurance & Real Estate
Nominating Company: Microsoft Corporation

SUMMARY

Internet-mediated home banking screens read information to visually-handicapped customers, giving them access to the same full range of resources and options that all other customers enjoy.

LONG SUMMARY

In order to enable visually handicapped people to operate a Home Banking facility through the Internet, Bradesco developed BRADESCO NET - INTERNET BANKING PARA DEFICIENTES VISUAIS. This product uses technologies capable of `reading' data shown on Internet mediated Home Banking screens and transfer them to a voice synthesizer in an orderly way. Thus, the content of pages is told to the handicapped person who is
then able to find out his or her checking account balance and do all types of transactions, even the most complex, such as fund transfers and payment of bills. This user will have available the same resources used by other customers when they access the Home Banking site. The Home Banking services menu, all transactions involving that account, as well as a list of checks paid are slowly read aloud by the program.
Transactions are carried out by means of simple commands, and it is possible to adjust voice loudness and speed. The program also allows the visually handicapped, operating in the Internet all by themselves, to read any digitized text, such as news and online newspapers. They may also use Windows environment functions and some of its applications, which affords them new employment possibilities in the market. It is very simple to install the software. One only has to introduce the CD-ROM into the drive and the installer automatically reads the instructions to operate the system. Internet access is normally supplied through an access provider and common browsers, or by means of a `reduced cost Intranet' developed in conjunction with Telesp/Teleceará,
telephone services concessionaires, using a browser specially developed to that end.

Twenty thousand copies of the program on CD-ROM, accompanied by instructions in Braille, have been distributed to visually handicapped persons registered with specialized organizations and to the 9,000 members of the Brazilian Ophthalmology Council, the institution that assembles all eye doctors, who are enthusiastic supporters of this initiative. Any visually handicapped person can request a copy of the CD-ROM with a demonstration of the product (50 20-minute sessions) and
if interested, he or she may request a password for permanent operation. It is to be noted that the interaction with the computer through a phonated recognition of functions is not limited to access to services supplied by the bank, but is also valid in relation to other Windows 95 applications, file reading, and reading in tandem with typing, which even allows for text reviewing and checking. Each keyboard command is
spoken loudly by the voice synthesizer. In the case of MS-Word, each character typed is spelled and full sentences can be heard as the text is being written. The application is in Portuguese, but there are ongoing studies to translate it to other languages. The project created the need for basic training in computer operation for visually handicapped persons, and Bradesco Foundation, which has been the educational
arm of the bank since 1956 and presently maintains 36 schools, with 97,000 students with its own funds, decided to create a special course to

	cover that need. A regular 2-week course is presently in operation at Osasco and Porto Alegre and over 250 visually handicapped persons have already enrolled. This course will be extended to other schools and its acquired experience is at the disposal of other interested educational institutions and companies. The program was extensively broadcast by newspapers, magazines, specialized media and TV, with a very favorable repercussion.
BENEFITS	The Internet Banking program was developed to allow visually handicapped people to access their Bradesco accounts by themselves through the Internet, and also to help them perform all sorts of transactions, even the most complex, such as payment of bills and fund transfers. The initial objective was fully met and even surpassed, since it enables visually handicapped people to make the most of their computer resources and offers them employment possibilities previously considered unthinkable. Furthermore, it created the need and the possibility to organize basic information technology courses for the visually handicapped, as is already happening at Bradesco Foundation. The bank's concern with visually impaired people was awakened by a letter received in 1995 from a customer, Mr. Laercio Sant'Anna, who is visually handicapped. He wrote, on that occasion: `Dear Sir, I have a checking account at Bradesco and use the Bradesco home banking system through videotext, since I am visually handicapped. I work with computers and that makes it easier for me to use systems as the Bradesco one at home. This service rendered by Bradesco creates great opportunities for all those who know it, particularly for the blind who can solve big banking problems without having to leave their homes. Not all visually handicapped people have somebody available to help them, or can easily go their bank branches. When I began to access your service I noticed that it could be extremely interesting for visually impaired people and so I decided to get in touch with the bank to suggest that something more specific be undertaken, and the people I talked to suggested that I get in touch with you. The use of PCs by visually handicapped people is a reality today and the only reason why it is not more widespread is the high cost involved in the acquisition of specially adapted equipment, such as a voice synthesizer that would make it possible for the visually handicapped to hear what is on the screen. I'm sure that Bradesco's information technology department could develop a rather simple program that would send a sound signal to the computer loudspeaker, or to a sound board as the ones used for multimedia systems, which are not too expensive and could be easily acquired by any user of this program. The program would only need to ask the handicapped person which option he or she wants to access and, using an already existing program, automatically access a videotext, reading it and telling the user the result of the search just performed. I have no great experience in this area, but I know that voice synthesizers have been around for more than seven years and I put myself at your disposal regarding any information that might be useful, or any other kind of service I might supply in order to help this project to progress. I thank you in advance for the attention you give to this letter and hope that something may come of it, as I am convinced that this project would be extremely important and would differentiate Bradesco from all other banks. Cordially, Laercio Sant'Anna. Mauá, February 12th 1995.' In 1998, when his suggestion had been fully implemented, Mr. Sant'Anna wrote again, saying: `The first historical phase was marked by lack of information and lasted up to the year 1825; the second started on that year, when the Braille system of raise-point writing was invented, enabling visually handicapped people to have access to knowledge; the third historical phase is starting right now with the possibility given to the visually impaired to have access to the Internet. Today, surfing the Internet, I can read newspapers and get updated information. The biggest advance is not in the area of information technology, but in the attitude of a company [that was concerned enough to consider using modern resources to develop an enormously significant product for the visually handicapped].' Another letter received by Bradesco soon after the product was announced and the training courses to teach visually handicapped people to use the new tool were already in operation, is also highly significant: `Dear Sirs, Filled with joy and lots of hope for a better and more consistent future for visually handicapped persons I followed the (final) portion of a news feature shown by Bandeirantes TV station. Unfortunately I could not follow these news from the beginning, but the little I saw called my attention to Bradesco Foundation's excellent initiative in favor of all visually handicapped. I have a 17 year old son who is visually impaired. He dropped out of school when he was 15, because of an accident. This is a sad waste of great possibilities, since my son is fortunately in very good mental and physical health (excepting his eyes). He is super intelligent. We are now getting the Braille system that will allow him to continue to struggle to meet his goals, but all this is very difficult where we live. We have a computer, a scanner, and so on, and were trying to find a way to make the most of that technology which, coupled with our son's capabilities, could be very useful to enrich his knowledge base and open for him the possibility of a promising career, if ever he gets the chance. If possible, I would like to have more information regarding the training course and the possibility for

future apprenticeships. Please, don't
fail to give us an answer. This
is extremely important for us. We thank you for your attention and hope to get your reply as soon as possible. Once more, congratulations to those who sponsored this brilliant initiative. Sérgio Lopes and Vera Lopes. Porto Alegre, September 21st 1998.'

The visually handicapped
have been affected by a tremendous increase of their personal value, as perceived by them, because of the possibility of accessing the bank and managing their own affairs independently from other people's help, of learning how to use a computer, of creating new employment opportunities, besides entertainment and everything else that
is
made possible through the access to the Internet. What new advantage or opportunity does your project provide to people? This project makes available to the visually handicapped a new role, in view of the new possibilities offered them to perform professional activities and of increasing their relationships with local and global communities
through
Internet.

Thanks to the new tools, the visually
handicapped can now perform by themselves tasks that previously depended on the help given by other persons. Thus, their affairs and personal aspirations no longer need to be told to third parties, since they now can fully control the confidentiality of such information. This is a new individual freedom dimension.

The development of Bradesco
Net - Internet Banking para Deficientes Visuais demanded a long assessment of available technologies, and the development and adaptation of the technology finally adopted. Its disclosure showed developers the wide range of possibilities for the application of this technology, stimulating new initiatives that will certainly create new opportunities for visually handicapped persons.

New changes
will unfold because of increased demands from the labor market and qualification of visually handicapped people that will be made possible through reduction of computer costs, availability of other special softwares, and a greater society concern with employment opportunities for the visually handicapped.

IMPORTANCE

In order to develop Bradesco Net - Internet Banking para Deficientes Visuais, several existing voice synthesizing technologies were analyzed. DOSVOX was initially considered adequate. This is a software developed at the University of Rio de Janeiro - UFRJ, but with the emergence of Windows and later on of the Internet, new technologies were studied until we identified Virtual Vision, a software developed by Micropower for reading Windows programs. Working together, Bradesco, Scopus - Bradesco's technology company - and Micropower teams adapted Virtual Vision to the desired function so as to provide access to Internet Banking to visually impaired people and, therefore, access to the
Internet as a
whole, complementing the access to Windows functions that was the initial objective pursued by Virtual Vision. New demands from visually impaired customers shall certainly result in new Virtual Vision developments, as well as that of other voice synthesizers. The original goal of the project was to give access to Internet Banking to
Bradesco
customers, not aiming at any financial outcome since at
that time Bradesco had only 2,000 visually handicapped customers and only about 5% of them had direct or indirect access to computers. The other goal was to make it possible for a larger number of visually handicapped persons to fully use banking services. The target audience response increased
gradually over the four months that went by
since the introduction of the product, and we expect a tipping point in the adoption curve to appear during the first semester of 1999. The project defines new change opportunities for society, since it will be forced to understand that a visually handicapped person is someone that can be trained and can be useful to society. `This product is the beginning of an evolution as important as the Braille system invention,' declared the president of the Brazilian Ophthalmology Council, Dr. Geraldo de Almeida. `The advances it will foster in the cultural, human and economic arenas will open a large labor market for the visually handicapped.' `We are sure that Bradesco's example in giving support to visually handicapped persons with the help of information technology will be rapidly followed by other institutions inside or outside Internet', states Odécio Gregio a Bradesco director. `In fact, according to the World Health Organization there are approximately 150,000 visually handicapped persons in Brazil and an equally large number of people with less than 20% of normal vision.'

Bradesco's initiative by itself will yield results far beyond
its 2,000 visually impaired customers, either directly, or through demonstrations. Bradesco is present throughout Brazil, in 1,300 locations. Other significant data are the following: 2,088 online, real time branches; 16,204 Bradesco Night and Day units that process on average 2,756 million online, real time operations a day; 2,608 Bradesco
Cash
Dispenser units processing 6 million transactions per month;
13,905 Telebradesco corporate systems installed at our customers facilities; 27,270 Electronic Cashier Terminals; 6.2 million checking accounts; 18.7 million saving accounts; 2.4 million shareholders in Mutual Stock, Fixed Income, and Foreign Investment funds; 3.2 million

	customers on average served every day by our tellers. Society as a whole, however, will have to play an important role to take this new technology to the visually impaired and prepared them, so that they will be able to use it and thereby exploit their full potential.
ORIGINALITY	In a certain way, to access banking accounts through the Internet already is somewhat original; to perform complex transactions as fund transfers, payment of bills, taxes, and others is even more original; and now all of that can be done by a visually handicapped person, which is really exceptional! This is an original and unique application, and as far as we know no other bank in the world has developed a system that enables their visually handicapped customers to access their accounts by any means whatsoever, much less so through the Internet. It is certainly the best practical utilization of a voice synthesizing software. When Bradesco received the letter sent by Mr. Laercio Sant'Anna (see above), on February 2nd 1995, in which he praised the Telebradesco Residência system (DOS version) and suggested the development of an application that would make it easy for visually handicapped people to access banking information, the bank picked up the glove. Mr. Sant'Anna's help was immediately requested. Together they studied technologies developed by the University of Rio de Janeiro (UFRJ), the University of Campinas (UNICAMP), and the University of São Paulo (USP). An experimental system called DOSVOX, developed by a team of visually handicapped people from the University of Rio de Janeiro, was tested through videotext. Soon after, however, the bank introduced a Windows version of its Telebradesco Residência home banking system and studies had to be done again from scratch. When Bradesco Net Internet Banking was introduced in May, 1995, this was considered a definitive solution concerning interaction with customers and efforts were intensified to bring about this result. After two years of research, in September, 1997, following a recommendation by Professor Borges from UFRJ, the bank got in touch with Micropower, a company that had a software capable of reading Windows texts. This was Virtual Vision, totally developed in Brazil. From then on the team work performed by Bradesco, Scopus - the Bradesco organization technology company - and Micropower produced, after seven months of intense activity, the application Bradesco Net - Internet Banking para Deficientes Visuais and its by-product, an improved version of Virtual Vision. During the deployment of this process alterations had to be made in the Internet Banking application, associating text to its graphics and fields that could be `read' by visually handicapped persons. Special attention was given to the confidentiality of the password. All this was possible only because Bradesco managed to put into practice a successful strategy for information and telecommunication systems. Since 1962, when Bradesco was the first private company in Brazil to have a computer - an IBM 1401 - the bank has occupied a position of pioneering leadership in information systems, emphasized by major events like: issuing stock certificates via computer (1965); first automatic cash dispenser in Brazil (1970); introduction of CMC7 checks in the market and standardization of the magnetic and logical handling of checks (1972); introduction of a pioneer system for the electronic collection of receivables credited on the same day (1976); first magnetic card technology tests (1978); implementation of the first Brazilian home banking system - Telebradesco Residência- (1982); installation of the first ATM - Automatic Teller Machines in the Brazilian banking system that later became Bradesco Day and Night (1982); implementation of the first Brazilian office banking system - Telebradesco Empresa - (1983); inauguration of the first Brazilian system for banking services via telephone with a sound reply equipment (Telesaldo) that is known today as Fone Fácil Bradesco (1986); introduction of the first Brazilian private satellite communication system (1989), when Bradesco became the first bank in the Brazilian banking network to operate with all branches connected online, real time (1990); implementation of bank balance and bank statement information services via fax - Fax Fácil Bradesco - (1991); the first Brazilian financial institution to join Internet (1995); Bradesco's exclusive introduction in Brazil of the software Money for Windows 95 fully integrated with Telebradesco Residência, and one of four banks in the world to introduce this software (1995), which started to operate Bradesco Net-Internet Banking, a complete home banking system via the Internet; and the introduction of Bradesco Net - Electronic Commerce.
SUCCESS	The project surpassed its original objectives because besides making it possible for visually handicapped persons to access their Bradesco accounts, it also created basic information technology training courses and new employment opportunities for the visually handicapped. It is totally operational. It is self-installed and instructions for its utilization are slowly presented to the user. A free of

	charge technical support service was also defined and uses a call center with a 0800 number. During the first four months after the project was introduced approximately 500 visually impaired Bradesco customers were already accessing Internet Banking. About 100 visually handicapped customers have already taken the basic information technology course given by Bradesco Foundation and 150 more have enrolled for future courses. Moreover, Bradesco received many manifestations from people and institutions, indicating that the project did have a remarkable social impact. A good example is that of a 62-year old dentist that became totally blind because of diabetes. Throughout his life he had always managed all his affairs and kept himself updated regarding dentistry developments, with constant access to information. After he lost his vision the access to some of that information was possible only with his son's help. When he learned about Bradesco's project and the basic information technology course given by the Foundation, he enrolled in the course so as to get his copy of Bradesco Net - Internet Banking para Deficientes Visuais. After completing the course he was able again to personally manage his Bradesco account and had access to newspaper articles and several other types of information through the Internet. His life once more began to make sense. Some companies already employ visually handicapped people to do repetitive tasks and they are interested in training these employees so that they can perform other tasks that require using computers. Manifestations as the ones shown below are highly significant: `Congratulations! I am not visually handicapped but I was deeply moved when I learned that a financial institution such as yours has this kind of social concern. This proves that technology advances coupled with caring about human beings can give rise to more optimistic feelings in this world. Congratulations. Humberto Souza de Moraes and Marcos Alexandre Gomes dos Santos.' `I have just seen on television the introduction of a new Bradesco service for visually handicapped people. Even though I have a perfect vision, I cannot help but be moved by such wonderful news. You are to be congratulated!' Aristides José de Souza.' `I would like to congratulate the bank and its Foundation for all your educational activities, particularly your initiative of offering professional training for handicapped persons. I have a visually handicapped 13-year old daughter and would love to have more information about the information technology training program just being implemented by Bradesco Foundation. I hope to be able to get in touch with you and congratulations, again! This is how we are going to really change our country, making things happen that point to a much better future. Graça Cabral.' The product was introduced only four months ago. Bradesco is carefully monitoring the behavior of users and prospects in order to make any necessary improvements. On the other hand, the project will include every new feature that may be implemented in the present Internet Banking system in the future.
DIFFICULTY	The first difficulty was to identify a voice synthesizer that could be synchronized with Bradesco's home banking services, that would be easy to install, that would use regular equipment, and the cost of which would allow for mass production. The next problem was to adapt the software to Bradesco's home banking system so as to synchronize it with Micropower's Virtual Vision, and its adaptation to Bradesco Net-Internet Banking. Some interesting technical problems were the texts describing images, the masking of keyed-in passwords, and the verbal expression of commands. Surveys done to locate the best software for home banking tasks were undertaken together with the Universities of São Paulo and Rio de Janeiro. We were looking for a specialized product that would take into account the large number of Portuguese accents and sounds and then produce a phonetic representation unequivocally easy to understand. The biggest organizational problem was the distribution of CD-ROM copies. In Brazil there is no record of visually handicapped persons that would enable Bradesco to reach them directly. We also had great difficulty in obtaining the address of institutions working with blind people, and when they were finally located, their records frequently were incomplete because they lacked the necessary funds to keep them updated. Another difficulty regards the training of visually handicapped persons in information technology and teaching them how to use a computer. There is an ongoing effort to encourage pertinent institutions to have at least one multimedia computer installed in their libraries.