

Use of information technology for direct service provision to people with print disabilities.

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Abstract:

RVIB Library and Information Services provide a range of services to people with print disabilities throughout Australia. Staff at RVIB are constantly researching and developing products which can provide users with improved and independent access to information. This paper discusses two initiatives which RVIB hopes will help revolutionize the way people with print disabilities access information.

These initiatives are

- *giving users the ability to order books while searching the library's OPAC remotely and at the same time sample and access full text files of audio, braille and text formatted for large print and,*
- *the convergence of text, braille and audio files in one format or medium. The DAISY project – (Digitized Audio-Based Information System) integrates digital audio and text files on CD-ROM.*

Introduction

Considerable attention has been focussed on the use of modern information technology in libraries, mostly in mainstream academic and public libraries. However, information technology has also had an important impact on libraries specializing in the provision of information to people with print disabilities. These libraries have unique needs arising from the nature of their clients' disabilities, which prevent personal attendance at the library. This has ramifications for many aspects of the service of these libraries, and some of the activities of these libraries go well beyond those of their "mainstream" counterparts.

One distinguishing feature of many libraries providing materials to people with print disabilities is that they are also producers of materials in alternative formats, that is audio, braille, large print and computer disk. One of the major issues currently facing these libraries and other producers of materials in print alternative formats is the future format for the production of these materials.

Libraries for people with print disabilities use information technology to adapt systems for use by people with print disabilities. Examples of this adaptive technology are the use of text to speech conversion, and software that enlarges text displays on a computer monitor, or displays screen output in braille. More general developments in information technology, such as the Internet and the mass electronic storage and distribution of information, are also having a profound effect on these specialist libraries.

Information technology has also had a significant effect on service provision in libraries. For people with print disabilities there is a special significance, because information technology is now providing opportunities for direct, timely, independent and private access to large amounts of print information which until now has not been accessible.

Service providers in this area find themselves on the brink of a new era. Decisions are being made which will have profound effects on the future delivery of information to people with print disabilities. The advent of electronically available information has meant that, for the first time, the concept of mainstreaming – that is, the integration of specialist services for people with disabilities into all library services - could become a reality.

Electronic delivery of all information may not be widespread for some time, especially in public libraries. However, libraries that specialize in providing materials in print alternative formats must be deeply concerned with the development of information technology for information provision in a new mainstream context. They are well placed to do so, having had considerable experience with transcribing information into print alternative formats and in responding to the needs of print alternative format users.

Definition of Print Disability

The Round Table on Information Access for People with Print Disabilities has released a definition of print disability¹. This definition is:

People with print disabilities are those who cannot independently obtain access to information in a print form because they:

- *are blind or vision impaired; or*
- *have physical disabilities which limit their ability to hold or manipulate information in a printed form; or*
- *have perceptual or other disabilities which limit their ability to follow a line of print or which affect their concentration; or*
- *because of a lack of literacy or language skills, cannot comprehend information in a printed form.*

RVIB Library & Information Services

The Royal Victorian Institute for the Blind Library & Information Services (RVIB L&IS) provide a range of services to people with print disabilities throughout Australia. There are five core services:

- A public library service, which includes a wide range of print alternative books, magazines and newspapers available for loan, provides access to a wide range of electronic resources through the RVIB web site and provides other specialist information in alternative formats.
- Within the public library service, a reference service, Print Alternative Reference Service of Australia (PAISA), which provides answers to reference enquiries in the required accessible format.
- A student and vocational support service (SVSS) for students and others requiring information to fulfil study or vocational needs. RVIB L&IS provides “fast-track” long-term loans of required material from its own collection or from the collections of other libraries. It also initiates new production of material not already available in the required format.
- A special transcription service (STS) transcribes brief, ephemeral and personal material rapidly and with complete confidentiality.
- A Print Reference Service, which provides access to a specialized collection of print materials relating to the work of the organization for RVIB staff, the public and others.

Given the range of services we are providing and the fact that most of this provision happens with no face to face contact, staff at RVIB are constantly researching and developing products which can provide users with improved and independent access to information.

Remote OPAC access and ordering facilities

One issue of key importance in the delivery of library and information services to people with print disabilities is access to catalogues. A major focus in this area has been to provide up to date and independent access to library resources. In the past this has been difficult because the only way to provide independent access to this information was to provide the catalogue in the reader's preferred format, for example in braille or audio. While this supported independent access, keeping information up to date was very difficult and in most cases the catalogue was out of date almost as soon as it was brailled, recorded or saved to disk.

Using the Internet

The development of remote access to catalogues and remote searching facilities, particularly via the Internet, has been instrumental in contributing to independent and up to date access to library resources for people with print disabilities. One of the most popular services provided by RVIB L&IS is the ability to order books via a remote search using the Library's On Line Public Access Catalogue (OPAC).

For about four years, RVIB has given registered library users the ability to order books from the library while searching the OPAC remotely, either by direct modem dial-up or via the Internet. Until recently the OPAC was a character based application requiring access via a telnet session either directly or via the world wide web. Now the OPAC is also available as a fully interactive web application which, like its earlier counterpart, has been designed for the greatest ease of use by people with a print disability.

For such people, the ability to search a catalogue via the Internet using appropriate adaptive technology such as speech output or text enlarging software, is one of the best methods of providing independent access to a library's resources. Giving users the option to order books while they search or browse the catalogue extends that independence. Using a pre-allocated pin number the user can order any number of books they want to read. Orders are automatically emailed back to the library and transferred to the reader's request list store on the library computer system. The books are then dispatched to the reader via Australia Post in due course.

Of course, many other libraries provide remote catalogue searching facilities, if not ordering facilities. However, the design of some of these facilities does not always take into consideration the accessibility issues which make these facilities useable by people who must use adaptive technology. While this paper is not meant to be a treatise on accessible web page design, it would be remiss not to at least mention that many organizations, libraries included, are excluding people with disabilities from accessing the services offered via the Internet. This is because they are designing web sites which are not easily accessible using adaptive technology.

In recent times accessible web page design has been receiving increasing attention. As the sophistication of the information available and the formats in which the information is made available on the Internet grows, so do the problems associated with access by people with print disabilities. In particular, mouse driven graphical user interfaces (GUIs) on the World Wide Web, present unique problems for this group of users. Adaptive technology will almost always be developed to deal with products after they have been made available to the general public and there has been some discussion about how libraries can deal with these problems². Other discussion has focussed on how to design accessible web pages. There is a considerable amount of literature dealing with this topic both published in print and on the Internet itself. Much of this literature provides details of features which can be incorporated into the design of web pages, in order to maximize access by people with print disabilities.

Using IVR technology and the Internet

RVIB was one of the first libraries using Interactive Voice Response (IVR) technology to establish access via a telephone to computer stored information such as newspapers, catalogues and other general information. This information can be voice recorded, or synthesized voice can be used to convert text to audio. This method allows for a great deal of flexibility, allowing the user to choose their time of access and providing total independence and privacy in their choice of material to access. All choices can be made via the telephone keypad.

RVIB's Voice Print service allows users to access the library catalogue, listen to the latest titles available, search by subject or author, listen to a catalogue listing of any title including a brief annotation and, if they wish, order the book for future reading. In the near future it hoped to add to this, in the case of audio titles, the facility to listen to a brief sound clip from the title.

Voice Print also offers access to the full editorial text of a range of publications - The Age, Australian Financial Review, Business Review Weekly, Sydney Morning Herald, the Melbourne Herald Sun, the Adelaide Advertiser and The Australian. In addition, it offers access to a wide range of other information about the activities of RVIB and other topics of interest to people with a print disability.

Voice Print is an important alternative technology for users who require remote access to information but who have no access to a computer or the Internet. This choice of access mode is of particular importance when the demographics of our users are considered. Significant numbers of people with print disabilities are older people with age related print disabilities such as vision impairment. Many of these people do not have access to computer facilities.

A service such as Voice Print, which requires a user to make a phone call to a central server, obviously disadvantages those outside the telephone area where the service is located. In the case of RVIB, for instance, where the server is located in Melbourne, users elsewhere in Victoria must incur STD charges to access the system.

RVIB is working to overcome this inequity by installing “relay” servers in major regional centres. These servers make use of Internet Telephony technology to provide the service in regional areas at the cost of a local call, with the “trunk call” communication being transmitted via the Internet rather than conventional telephone lines.

RVIB has already established a pilot service in Geelong, using this technology. This project was funded by the Victorian Government in cooperation with the Geelong Regional Library Corporation. A further grant has been made, and in the first half of 2000 it is hoped to establish five or six more “relay” servers in major provincial centres in Victoria.

Investigations are also being made into the use of Voice over IP cards in communications routers at provincial libraries and at VICNET. This would be a more sophisticated way of supporting the service, doing away with the need for a standalone PC server at each provincial location, and making the service no longer dependent, as it is now, on a commercial Voice over IP service provider.

Availability of files for viewing via the catalogue

Another RVIB project currently under way will give registered library users access to the full text, braille and samples of audio files held at the library. This is achieved by storing the digital files in text, braille or audio format online linked to the matching catalogue entry.

The benefits that this will bring the user include:

- The ability to listen to a short sample of an audio book
- The ability, subject to copyright restrictions, to download either a sample or the full text of a title in ascii or braille format

With this facility, a user can ensure the book they have located on the catalogue really suits their needs – like shelf browsing for non-print library users. Having ascertained that the book is what is required the user can download the full file, either e-text or braille.

The online storage of more than a few sample audio files of full titles is not at this stage practical, due to the size of these files (even with MPEG3 compression) and the limits of existing storage. Furthermore, most of RVIB’s current collection is stored on analogue tape reels, not in digital format. As the collection is progressively converted to digital format – which is what the next section is about – we anticipate that advances in data storage technology will eventually allow online storage of the full collection giving the users the ability to download an audio title on demand.

Looking into the future, we can foresee digital books being downloaded into the home via cable modem or similar high speed device, stored in high capacity solid state memory devices which will be the size of a mini cassette, and played on a hand held device similar to a diskman. The same device could be used, with simple navigation keys, for

the user to interact with the library in a similar way as they now do by phone using Voice Print, to search the catalogue and order titles.

One of the advantages of this future scenario (subject always to any remaining copyright restrictions) is that as there will no longer be a physical medium, the number of copies of a single title that can be made available simultaneously will be unrestricted. Furthermore the space required to store circulation stock, now a significant proportion of the library's floor space, will be reduced to the size of a few computer file servers.

DAISY Digital Talking Book System

As discussed earlier one of the major issues currently being discussed by libraries providing materials in print alternative formats is what the format of the future will be. Recording for the Blind and Dyslexic in the United States and some Australian libraries, have been producing and distributing books in disk format for sometime. Others, including the Canadian National Institute for the Blind, Library of Congress and the Royal National Institute for the Blind have stood by their commitment to using digital audio equipment by the end of the nineties.

The major development in this area is the DAISY project, "Digitized Audio-Based Information System". DAISY is an international project being coordinated by a consortium of libraries for people with print disabilities from all over the world. RVIB is a member of the consortium along with other major alternate format libraries in Australia and New Zealand, and is one of the major participants in the trials of the software required to produce audio books in this new digital format. The DAISY project is based on a concept which involves the convergence of text, braille and audio files in one format or medium currently a CD-ROM. The DAISY system can be used to create four products:

- An audio book with navigation features,
- A book that is electronic text only,
- A braille version produced from the electronic text, and
- A book that is full text and full audio completely synchronized.

These CDs can then be played on a computer to access the text, audio or braille, or on a specially designed playback unit to access the audio in a searchable way. For example the user can access the audio reading of a text by skipping to a specific page, setting bookmarks and skipping through the text by page, paragraph, phrase, etc. This format gives users access to audio information in a way that most closely resembles print access.

The development of DAISY began with the aim of establishing a digital talking book system specifically for the production of talking books for readers with print disabilities. It has since developed into a system for the production and storage of all formats on one medium. DAISY production is computer-based and can be used to directly record speech or to convert existing audio recordings into the DAISY format.

The objectives of the DAISY Consortium in this development are:

- To give readers with print disabilities the same flexibility when accessing printed information as sighted readers. This means fast, random access to any part of the recording.
- To utilize international standards to create a system that is independent of existing distribution media, so it can be easily adapted to future technology.

DAISY Production System

Using international standards, DAISY records and converts speech into a digital sound file. The narrator or producer structures the digitized voice by placing index keys according to the book's structure. Typically these are headings, chapters, pages, sections and any other structural element of a book. As the book is structured, using XML tags, a computer file containing an electronic table of contents is created, which is cross-referenced to the sound file. A book could be encoded to the level of linking every word of the text to the audio file or it is possible to create an e-text (electronic text book) without any recorded voice files at all.

DAISY Playback System

The completed DAISY book can be produced on various media. CD-ROM for example, can be used on the *Plextalk* talking book player. Compression techniques allow for the storage of up to 50 hours on one CD. The e-text and the braille files ready for embossing are very small in comparison to the audio files. In fact you could fit several hundred of these on one CD-ROM.

The completed DAISY audio book can be read using a computer equipped with playback software, a CD-ROM drive, a sound card, and speakers. Alternatively, the CD can be played on the *Plextalk* mentioned above or the *Victor* talking book player, and these are described below.

The playback software allows the reader to quickly access all the information in the recorded text, using the electronic table of contents to navigate through the text. A book's accessibility is only limited by the number of selected index keys, making DAISY an ideal format for reference works and student textbooks in particular.

The playback software uses synthesized speech to guide the reader through the playback system and standard keys on the computer keyboard allow access to the various search points or levels of indexing. For example, a cookbook recorded in DAISY format might have three levels of indexing: Level 1 for major sections like "Main Meals"; Level 2 for subsections like "Hot Meals"; and Level 3 for each individual recipe. By pressing the relevant key the reader can immediately access any desired level and skip through the audio book to locate the information he or she requires. The playback speed can also be adjusted.

PLEXTALK and Victor Talking Book Players

These portable, dedicated CD/CD-ROM players can be used instead of the PC-based DAISY playback software. These players provide the same random text access as the personal computer as described in section 2. They will also play standard music or other CD's.

These units have a telephone-type keypad, so the user can easily access any desired search point, as described earlier. The operating controls are very simple and a built-in speech synthesizer module provides vocal confirmation of any selected player function. As with the DAISY playback software, the speed can be adjusted without affecting the pitch.

To ensure that the audio recording is safe and easy to handle, CD's are placed in a "caddy" which can be inserted into the player. By avoiding any direct handling of the CD by the user, corruption of the disc is kept to a minimum.

The Future of DAISY

DAISY is still in development and versions of the software are being used and trialled by talking book producers around the world, including the RVIB Library & Information Services.

The Japanese Society for Rehabilitation of Persons with Disabilities (JSRPD) has developed DAISY compliant production software called *Sigtuna* which has already been used to transfer 2,000 analogue audio books to the DAISY format. The Royal National Institute for the Blind (RNIB) is also producing DAISY compliant audio books and has announced its intention to purchase 10,000 *Plectalk* players to be provided to borrowers in the UK.

Trials are already proving that DAISY can give readers with print disabilities the same speed and flexibility when accessing printed information as fully sighted readers. DAISY is being promoted by its designers as ideally suited for audio textbooks, but its rapid access to information suggests that it could be used to record a much wider range of spoken word material.

Conclusion

In 1984 Barrie Mitcheson wrote "Librarians are now faced with an almost bewildering range of new technology which presents a virtual Pandora's box. The dynamic nature of this technology complicates the long term planning of information systems and the integration of traditional information systems with the new³". This statement in some ways describes the situation in which libraries for people with print disabilities now find themselves. The 1990s have been a decade of radical change in the provision of information to people with disabilities.

Trevor Housley predicted in his paper given at the 1988 LAA Conference that "DIGITAL" would be the name of the game in the 1990s⁴. He said that telecommunications would have a profound effect on information access to people with print disabilities in the future. It is without doubt that most people working in this area would have agreed with him and most now find themselves in the midst of conversion to digital formats.

Interestingly, these same advances in technology have provided a means for cooperation, resource sharing and joint developments between libraries for people with print disabilities, both nationally and internationally, which has not been possible in the past. In fact, this opportunity for cooperative development has enabled many libraries to work together to develop products and services which may not have been undertaken by an individual library. The DAISY project is one example. It has also enabled smaller libraries to participate alongside larger organizations where they may have otherwise been excluded.

Once again, Australian libraries, this time those providing information to people with print disabilities, are at the forefront of global developments in information technology and information services. RVIB is confident that they are making a significant contribution to developing products which can provide users with improved and independent access to information. The challenge now is continue the work that has been started and to work with mainstream libraries and organizations to ensure that other initiatives are developed in order to maximize access by people with print disabilities.

Bibliographic References

¹From a memo to the Round Table Executive from the Immediate Past President Bill Byrne, dated 14 October 1993.

² Deines-Jones, Courtney. "Access to Library Internet Services for Patrons with Disabilities: Pragmatic Considerations for Developers," *Library Hi Tech* 14 (January 1996), 62.

³ Barrie Mitcheson, "Libraries and Information Technology," in *Technological Change: Impact of Information Technology 1984*, The Department of Science and Technology and The Australian Computer Society. (Canberra: Canberra Publishing and Printing Co. for the National Information Technology, n.d.), 173.

⁴ Trevor Housley, "Computer Communications in the 90's: A Transcript of a presentation," in *Living Together - People Persuasion Power*. Proceedings of the 25th LAA Conference, Sydney 1988, ed. Janet Robinson (Sydney: Library Association of Australia, 1988), 21.