The Impact of ICT on Library Services for the Visually Impaired

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Abstract. ICT gives visually impaired people two fundamental freedoms – Independence and Choice in library services. Before electronic information and on-line catalogues became available visually impaired people required assistance with reading and had limited choice of reading material. But now visually impaired people are no longer disabled in searching and surfing information on digital libraries. This study examines the ICT impact on library services for the visually impaired in mainstream libraries. New opportunities for mainstream libraries to integrate visually impaired people are discussed as well as the problems facing the mainstream libraries.

1 Introduction

Does the Information Communication Technology (ICT) give an opportunity to general libraries to open their doors to the blind and visually impaired people? Unlike other disabled people, visually impaired people have not been recognized as users by the librarians of local libraries in most countries mainly due to their inability to read printed materials. Instead, visually impaired people have been left on the hands of social workers or volunteers who produce Braille and talking books—alternative formats—for the blind. However, the production of these materials in alternative formats for the visually impaired amounts only up to 2% of the total reading materials published per year even in the most developed countries. Even in Canada, the visually impaired receive much less opportunity to access library materials compared to the rest of the general populations. For example, Calgary Public Library in Albert, Canada, has 14,000 items in alternative formats for the visually impaired, while there are more than 2 million items for the rest of the populations[1].

Attempts spearheaded by governments in many countries have been made to level the disparity in access to information between the haves and have-nots. Korean government is not an exception. Minimizing digital divide the Korean government has been financially supporting public or private sectors which developed programs or services designed for the disadvantaged in society. The programs include helping

[1] Rosemary Griebel: Partnering services between public libraries and library services for the blind: a Canadian experience. PNLA Quarterly, Vol.65 (2000). 17.

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disabled people to get the IT literacy, etc. Nevertheless, majority of disabled people in Korea are still marginalized in the mainstreams of library services. They have to sorely rely on private sectors with very limited resources for reading. Some public libraries in Korea have attempted to provide the visually impaired with talking books and Braille by installing production facilities for materials in alternative formats within their premise. But this could not be an appropriate solution to solve the shortage of reading materials for the visually impaired. Considering the financial situation of the most of the public libraries in Korea, for an individual library to set up such production unit is not practical. Generally the cost for installing the production unit is about US$100,000 which is higher than their annual budget for purchasing library materials. In addition to this, the production cost of materials in alternative reading formats is 10 times higher than that of printed sources. Moreover, since the production of materials in alternative formats is very time consuming, some items take more than 2 years to be placed on the shelf. And even if public libraries can afford the expenses in producing materials in alternative formats, they cannot overcome the imbalance in the accessibilities for reading materials between the print disabled and their peers without disabilities. New strategies should be sought for the disabled, such that they, in this era of digital library services, will not be fallen into the disadvantaged group, unlike the previous era in which electronic materials did not exist and over 90 % of the materials housed by public libraries were in printed format.

This paper discusses the impact of ICT on lives of disabled people and the attempts of general libraries to integrate the disabled into the mainstream of their library services. Also the most common problems of mainstream libraries, when they implement new services for the print disabled, are pointed out by analyzing the practices done by the National Library of Korea.

2 The Impact of ICT on Lives of Disabled People

The development of library services for the disabled has been paralleled with the development of new technology which has played a significant role in the increase of library membership, particularly in the print disabled[2]. In the 1930s, the advent of talking books served as a milestone in the progress of library services for the visually impaired. The talking books are voice recordings of printed materials, which are used as a means of compensating people with reading difficulties. Before the production of talking books, Braille had been used as a major reading format for the blind. Braille is a system of six-dot cells invented by Louis Braille in 1829. Braille is read by using fingertips, thus requires the sensitivity in the fingertips. Therefore, the people who have lost eyesight at their latter stages of life find great difficulty in reading Braille because they may have lost the sensitivity in their fingertips already. Consequently they need another alternative format for reading. So the talking books have become an invaluable reading method for visually impaired people and also for those who cannot hold books or turn pages because of their physical limitation. Beside this, in some countries people with mental problems have benefited from talking books as well.

[2] Young Sook Lee: Accessible Library Services for People with Disabilities: A Model for Korean Libraries. A Ph.D thesis in the School of Library, Archive and Information Studies at University College London (2001) 69.

Since the introduction of the talking books, the readership in many countries has been increased. For instance, when the Royal National Institute for the Blind in Britain first introduced talking books in 1935, the readership of the talking books grew from 6,600 in 1950s to 22,000 in 1960, 40,000 in 1970s and over 66,000 in 1980s[3]. In the United States, as soon as talking books were introduced, legislation was passed by Congress to include talking books in the National Library Service (NLS) for the Blind at the Library of Congress (LC) and increased its annual appropriations to the LC to be used for talking books in 1935. The budget was increased from US$100,000 to $175,000 for the first talking book production in 1935, and later in 1959 the appropriation was $1,350,000, and in 1965 it was $2,446,000[4].

In Korea the first talking book services started in 1970s by Canes Club. One of the noticeable changes that happened since the introduction of the talking books was the increased number of services centers for the visually impaired. Before the introduction of talking books, there were few libraries for the blind in Korea. However, because talking books, compared Braille, were much easier to produce and also available in mass production with low cost, the advent of talking books initiated a number of services centers to spring up in order to meet the reading needs of visually impaired people.

The advent of talking books has contributed greatly to the increase of library membership of not only the visually impaired and but also people with other disabilities who cannot access print materials. Despite the great contribution of talking books, however, visually impaired people are still left poor in reading and information resources compared to sighted people. For instance, in the total stocks of the two largest libraries in Braille and talking books in Korea account for less than 10,000 titles. This number will be much lowered if duplication number is subtracted from it, and also the same titles are normally produced both in Braille and talking books. Even in developed countries, the situation is not much better than that in Korea. The holding of the Union Catalogue of alternative format materials in five English speaking countries including Australia, Canada, and USA lists approximately 250,000 titles[5]. This number is no more than that of a medium-seized public library in any developed countries. This was mentioned at the 63rd International Federation of Library Associations and Institutions (IFLA) General Conference in 1997 to raise the awareness of the library and information professionals worldwide for information needs of the disabled.

Although the development of talking book technology has increased the library memberships, the major services providers of the visually impaired were still the libraries for the blind, not the general libraries. Main reason is that the production of talking books still requires much human involvement: somebody has to read the printed materials for recording. But visually impaired people are now able to access

[3] Allan Leach: Library services in the United Kingdom. Paper to the Expert Meeting of Libraries for the Blind, prior to the IFLA General Conference, Brighton, the United Kingdom (1987).

[4] The National Library Service for the Blind and Physically Handicapped (NLSBPH) Library of Congress: A History of the National Library of Service for Blind and Handicapped Individuals, Library of Congress. That all may read: Library of Service for Blind and Physically Handicapped People (1983) 83-141.

[5] Rosemary Kavanagh, Barbara Freeze: VISUNET: A Vision of Virtual Library Services for the Blind. Paper to the 63rd IFLA General Conference, Copenhagen, Denmark (1997).

reading and information materials in the same way as their sighted counterparts. They can directly access the original text by using assistive technology. As a result, human involvement is no longer necessity. These days even a totally blind person can search the Internet when the computer is equipped with assistive technology such as a screen reader. "A friend of mine recently said to me that if she didn't know better she'd have thought that the Internet was made for blind people," said Damon Rose in his article, *The Internet: made for blind people*[6]. Visually impaired people who use various Internet services feel a great sense of independence. Moreover, the visually impaired are able to browse the up-to-date online catalogues and choose what they want to read, not what others think they want to read. Therefore, technology provides disabled people two fundamental rights: independence and choice. Probably the dream of a world where visually impaired people can independently access magazines, books, newspapers, documents and even private mails has come true. Thus, technology helps enhance the self-esteem and self-reliance of the disabled as they work and study independently and even feel normal. In fact, information technology may be more revolutionary for disabled people than for the rest of the population.

Another feature of electronic materials is that the same document could be converted into varying formats such as Braille, speech or large print by using assistive technology. Therefore, the visually impaired can choose their preferred formats of output, whether that be speech, Braille, large print for themselves or ink print for their sighted peers. In addition, multiple copies of the same format can be made within a short time; otherwise it would take several days or months if it is done by manually intensive methods. In the matter of storage of bulk Braille that has always been a headache in libraries, Braille materials in digitized format solve this storage problem. All these issues show the possibilities of general libraries to play a significant role in minimizing the dearth of reading and information resources for the visually impaired. Besides, these days more libraries in turn are increasingly moving into producing and providing electronic document through their digital library services. All these features of electronic materials could be a great opportunity to general libraries to open their doors to the visually impaired who have been lost customers for so long in general libraries.

3 Assistive Technology

Assistive computer technology means any modification made to standard computer software and hardware to enable people with disabilities to work independently. This is often called adaptive, access or enabling technology. In the US federal law, the definition of assistive technology comes from the Individuals with Disabilities Education Act (IDEA), stating "as used in this chapter, assistive technology device means any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve the functional capabilities of a child with disabilities" (Individuals with Disabilities Education Act, 1999, §300.5, from IDEA Practices, 2003)[7]. Assistive technology has

[6] Damon Rose: The Internet: made for Blind people. New Beacon, Vol.944. (1996) 7.

[7] School Library Accessibility: The Role of Assistive Technology. Teacher Librarian, Vol.31(2004) 15.

been developed along with the development of general computer technology. For instance, screen reading software is used to convert the text on the computer screen into speech. By using this software, the blind can access OPAC, electronic books, newspapers and various information resources through the Internet.

Assistive technology devices are often more expensive than the standard ones because of the high research and development costs and the small market. But more and more, the assistive technology is becoming the mainstream. For instance, when the first Kurzweil in the United States came out in the mid of 1970s, it cost about US$ 45,000. Also it was the size of a large washing machine. However, now the scanning equipment can be purchased for as little as US$120 and it is the size of a laptop. The early reading machine could only read certain types of quality print on good quality paper, but nowadays even the cheapest scanner can read more styles of print than the first reading machine. The reduction in price of assistive technology devices is rendering a great deal of opportunity for general libraries to meet the needs of the visually impaired without spending a large amount of money.

Among the access technology the following are the most popular:

Screen Readers
The screen readers or speech access software are the most common forms of assistive technology which are used with speech synthesis hardware to convert the text on the computer screen into speech. Some screen readers work two-ways, both reading and writing. People who cannot use a keyboard or mouse because of limited mobility may use this two-way software. There are numerous screen reader products available and the software price ranges from US$200 to US$250 for read-only station.

Screen Magnifiers
Screen magnifiers help partially sighted people to view the contents on a computer screen at various levels of magnification. They are able to magnify a line, a word, or an icon as large as the computer screen allows. It can also change the background color and textual color to help those having trouble distinguishing a certain color combination. The price of screen magnifiers ranges from US$400 to US$2,000. In addition, some computer operating systems, such as Microsoft Windows 98 and above, offer built-in accessibility options, including a magnifier.

Braille Displayer
It is also called a Braille display or softBraille. A series of dots can be raised to form Braille characters. Braille displays are usually augmented to standard keyboards. Blind people use the keyboard as an input device and the Braille displayer to read what is on the screen. The range of price is from US$1,500 to US$15,000.

Braille Embossers
Braille embossers are the printers that punch out Braille. In most cases, these printers only print the Braille on one side of the paper. But there are double sides Braille embossers which line up the Braille dots so that the dots punched on the one side of the paper do not interfere with the dots punched on the other. The price ranges from US$600 to US$7,500.

Braille Translators
Braille translators translate text to Braille. Non-text information such as charts, graphs or mathematical formulas cannot be accessed. There are several packages which are based on DOS, Windows and MAC. The range of price is from US$150 to US$1,000.

4 Opportunity for General Libraries

As mentioned earlier, various factors in technological environment affect general libraries in their accessibility by the disabled. In fact, accessibility has already become a legal matter since disability discrimination acts are already in effect in some countries such as the United States and the United Kingdom. No person with disability shall be excluded from the participation in, be denied the benefit of, or be subjected to discrimination under any services or programs that is supported by public fund. In Korea, a disability discrimination act is under preparation and will come out within this year.

Whether or not such laws exist, in ethical aspect, the library professional should recognize their disabled users by integrating them into the rest of the users. Therefore, the library services must offer equitable access to information resources to the disabled, as much as to their non-disabled counterparts.

In pursuance of this, the National Library of Korea, like many other libraries, is very committed to serving the visually impaired since the Internet and web open the digital library services in 2001. The staff at the National Library of Korea understands that the right to know is a fundamental citizenship issue in the democratic society in any countries. Therefore, they recognize that the visually impaired also have the same right as the rest of the populations to gain access to publicly funded general libraries such as schools, universities and public libraries. Unlike libraries for the blind, the National Library of Korea moves forward to the digital future. In 2003, the NLK began producing universities' textbook titles in digital format, and it has distributed them through the NLK's web site to the students with visual impairments from 2004. At the end of 2004, the total of titles of textbooks accounted for 2,276 (827,542 pages). This web based service reflects the NLK's commitment to integrate the visually impaired into the mainstream of library services by making its collections more useful and accessible to them. Before initiating this new service, the NLK, using the standard MAchine Readable Cataloging system (MARC), had already developed a union catalogue of alternative format materials, comprising 90,000 records that were housed by 32 libraries for the visually impaired. The major purpose of building the union catalogue is to minimize the duplication of alternative format materials housed by different libraries for the visually impaired. These libraries for the visually impaired offer limited amount of resources, and they are run by private sectors. In fact, most of them are hard to be called libraries because of both the quality and quantity in their holdings, and also because they are run by social workers or volunteers, not by professional librarians. The more the duplicates are, the less the resources to the visually impaired. The union catalogue can be accessed at the KOLISNET, Korean Library Information System Network (www.nl.go.kr/kolisnet), and also at the NLK's visually impaired website (sigak.nl.go.kr/kn). Improvement in the services for the disabled are going to be accelerated since the responsibility of implementing library

policies at national level has been transferred from the Minister of Culture and Tourism to the NLK in the late 2004. Taking over the responsibility for implementing the national library policy, the NLK recommends to the government to install a library support center at the NLK in order to help the general libraries integrate the services for the disabled into the mainstream of their services. The center will be assumed a leadership role in the development and delivery of service to the visually impaired by making partnership with the libraries for the visually impaired. The center will also train library practitioners on the sensitivity of disabilities and assistive technology.

5 Common Problems Faced by General Libraries

Thanks to the ICT, the NLK has initiated new services for the visually impaired in Korea. Before developing new services, the NLK had invited the representatives from associations and agencies of the disabled to hear what they want. When a new service was initiated, the NLK has received ideas and recommendations from those who used the service from its beginning stage. But the service did not always satisfy the clients. For instance, the Full-text universities' textbooks in digital format, which is mentioned above, have not been used much by university students with disabilities. One of main reasons is that the students could not download the texts but should read them in front of computer. Unlike leisure reads, textbooks are read frequently, and therefore, the service had to be modified so that the textbooks could be downloaded to individuals' devices for later use. In addition to this, the textbooks could not meet the time when new semester started; they usually came out in the middle of the semester. These are the factors that dissatisfied the university students with disabilities. In order to provide this service, the NLK had spent a great sum of money, digitizing textbooks. The NLK learned a lesson from the above case. The NLK recognized what university students with disabilities needed but did not know how to make the product accessible and appropriate to the users.

Another common problem is that, when librarians develop a new service, they think that the services will be used sorely by those who have good sights, hearing and mobility. However, the truth is that there are many people with disabilities who try to make a use of it. For instance, nowadays web based services are becoming more available and the number of services is growing in many countries. Unfortunately, many of library websites cannot be accessed in particular by people with visual impairments due to their highly graphical and visual contents. Technology can be double-edged unless careful consideration is given to it. When Microsoft Window 95 came out, Windows became much easier to use than the previous versions of Windows. However, many visually impaired computer users immediately faced tremendous challenges. The information on the computer screen was represented graphically and not in a text format. Therefore, the graphics could not be read to those who used a screen reader. Neither speech nor Braille can interpret graphics. To overcome the graphical user interface, the NLK like other libraries has designed a text-only website for the visually impaired. But the disabled want to be treated the same as the others without disabilities. They want to use the same building, devices, programs, services, and websites as their able bodied peers do. They do not want to receive a special treatment. Unfortunately most librarians in general libraries do not have much knowl-

edge and experience on the characteristics of disabilities and the disabled. As a result, librarians are likely to develop what they thought the disabled wanted instead of what the disabled really wanted. Therefore, a universal design is the most crucial issue when a website is developed, since websites are the gateways to gain access to information and reading materials in the era of digital library services. In well-designed buildings, facilities or websites, disabled people do not need assistance at all, and they can even feel as normal as any other people by using them independently.

6 Conclusion

The ICT provides general libraries with an opportunity to integrate the services for the disabled into the mainstream of their services. This means that any individual with a disability should be able to visit any local library and receive access, directly or indirectly, to information and reading resources in accessible formats. Cost of ignoring the needs of the disabled can be higher than the cost of the solution. Generally, it is estimated that one in every ten of the population is disabled. On the economic front, as long as disabled people are excluded or discriminated from education, employment, programs, activities, or services, they remain unproductive and dependent. The cost of lifelong support to disabled people is costly and even wasteful.

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