



INFORMATION TECHNOLOGIES FOR VISUALLY IMPAIRED PEOPLE IN LIBRARY

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ABSTRACT

Technologies is very important for development of Visually Impaired people in social and culture activities in our society. ICT (Information Communication Technology) was developed various type resources to provide information easily such as SARA Angle, Pr.etc. Assistive Technologies' is used in library for visually impaired people .Role of information in society such as education, research and development as well as daily life of a person. Finding of the study was that visually impaired are aware of assistive technologies even through many of them are not using them .The outcome of the study was that higher authorities, librarians and the government to provide adequate resources ,information services and training to visually impaired people to access information without barriers.

Keywords': Visually Impaired Assistive Technologies, Resources, Partially Sighted, Braille.

I INTRODUCTION

The libraries have transformed drastically from the storehouses for books and journals to the powerhouses of knowledge and information since the middle of the 20th century. The information and communication technology, which is responsible for this revolution has drastically changed the organization, management and functioning of modern libraries. Modern libraries are increasingly being redefined as places to get unrestricted access to information in many formats and from many sources. In addition to providing materials, they also provide the services of specialists, librarians, who are experts at finding and organizing information and at interpreting information needs. More recently, libraries are understood as extending beyond the physical walls of a building, by including material accessible by electronic means, and by providing the assistance of librarians in navigating and analyzing tremendous amounts of knowledge with a variety of digital tools.

The term "library" has itself acquired a secondary meaning: "a collection of useful material for common use".

According to **S.R. Ranganathan**, "A library is a public institute or establishment charged with the care of the collection of books, the duty of making them accessible to those who required the use of them and the task of converting every person in its neighborhood into a habitual library goers and readers of a books "thus a library is regarded as a public institution which is also expected to convert the potential readers into actual readers.[1]



A.L.A. Glossary of Library and Information Science has defined library as, "a collection of materials organized to provide physical, bibliographical, and intellectual access to a target group, with a staff that is trained to provide services and programmers' related to the information needs of the target group. "[2]

The library aims at providing the necessary information and making them available to all the beneficiaries in the appropriate time. Generally, the objectives of library depend upon the types of library. The objectives of library are fulfilled through the functions and operations. A library function is a function that can be called by a program to perform some task, but it is not part of the program itself. Usually library functions are collected together into libraries, which comprise suites of functions that are loosely related in some way. A library should provide for lifelong self-education. Information/ documents on all subjects including local, national, international affairs to serve economic political and social welfare. Proper use of leisure, Advancement of culture and Preservation of literacy heritage for posterity.

In other words Library is a store house of information which consists of both book and non-book materials. It is considered as the most important place from where information in any field of knowledge can be obtained easily from different sources.

1.1.Visually impaired is a general term use to describe people who are partially-sighted or completely blind. The term will be use in similar sense throughout used for blind.

According to **Howell and Lazarus (2003)** he was defined "Visually Impaired" that visual impairment is term used for people who have some degree of sight ,but who have ,for example, a limited range of sight or focus that cannot be easily corrected with spectacles who are squint, who need special learning to be able to see ,who have burned vision sometimes as a result of cataracts or who have tunnel vision.[3]

According to "**world health organization**" (**WHO**) (**2009**) statistics there are about 314 millions visually impaired people globally with 45 million totally blind. 87% of the visually impaired live 50 year of age at higher risk. Although visually impaired people cannot read the conventional print they have the right to information and the read to read information in formats that are accessible to them. The librarian to make information available in alternative formats like audio Braille, or large prints that can be easily accessed by the visually impaired. The only materials that were available were a few audio books. Libraries have been produced online sources of information for people. Who are visually impaired living in the Durham region. The list is based on employment related needs and is meant to educate people with visually impairment in the services that are available specifically to them. There are number of libraries are available in India like .National Institute for the Visually Handicapped (NIVH) Library, Dehradun. Rehabilitation Society of Visually Impaired (RSV) Library, Lucknow..National Association for the Blind (NAB) Library ,New Delhi etc. [3]



II TECHNOLOGY

Technology has been defined as "systematic knowledge and action, usually of industrial processes but applicable to any recurrent activity". In providing tools and techniques for action, technology at once adds to and draws from a knowledge base in which theory and practice interact and compact. At its most general level technology may be regarded as definable specifiable way of doing anything. In other words, we may say a technology is a codified, communicable procedure for solving problems.[4]

Technology, Manfred Kochen observed, impacts in three stages. First, it enables us to do what we are now doing, but better, faster and cheaper; second, it enables us to do what we cannot do now; and third, it changes our life styles.

Information technology is a recent and comprehensive term, which describes the whole range of Processes for generation, storage, transmission, retrieval and processing of information. Technology used in Library as well as organizations.

III INFORMATION TECHNOLOGY

According to the **Webster's new encyclopedia**, "Information Technology is the collective term for various technologies involved in the processing and transmission of Information they include computing telecommunications and microelectronics" [4]

According to **ALA Glossary** "Information Technology as the application of computers and technologies to the acquisition, organization, storage, retrieval and dissemination of information". [5]

From the primitive days of human civilization to the present day, information has always been a component of growth and development and improvement of living standard. Now a day, the information has come to occupy the central position to be reckoned as the driving force for all human development. It is clearly interlinked with the growth and development in economic, political, social, occupational, culture and other sectors of the society. Information Knowledge have become the principle generator of wealth in the form of educational institutions, research and development establishment, scientific and technological centers and other similar Knowledge oriented bodies.

3.1. Information Technology: Infrastructure

The adaptation of any new technology requires the presence of an infrastructure with which it acquires, learn and successfully apply the technology. This includes sufficiently available human resources, well developed telecommunication networks, research and development capabilities and capital for investments.

3.1.1. Application Of Information Technology In Library

The library is the main information centre which can make use of the fat development IT for the benefits of mankind



as a whole. The librarian's preference of IT should include all those technologies which are expected to be used in the library activities/ operations and other library services for collection, processing, storage, retrieval and dissemination of recorded

Information, the fast developing information technologies have showered almost every areas of application including libraries. In case of libraries, these are good use in the following environments.

a) Library Management: Library management includes the following activities which will certainly be geared up by the use of these fast IT developments: Classification, Cataloguing, Indexing, Database creation, Database Indexing.

b) Library Automation: Library automation is the concept of reducing the human intervention in all the library services so that any user can receive the desired information with the maximum comfort and at the lowest cost. Major areas of the automation can be classified into two -organization of all library databases and all housekeeping operations of library.

c) Library Networking: Library networking means a group of Libraries and information centers are interconnected for some common pattern or design for information exchange and communication with a view to improve efficiency.

d) Audio-Video Technology: It includes photography, microfilms, microfiches, audio and tapes, printing, optical disk etc.

e) Technical Communication: Technical Communication consisting of technical writing, editing, publishing, DTP systems etc. [5]

IV INFORMATION AND COMMUNICATION TECHNOLOGY

ICT (information and communications technology - or technologies) is an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications. Access to ICT for Visually Impaired people may require resources than are provided for other differently-abled people. ICT helps to encourage people to become active participants in social, Cultural, and economic developments. ICT can be multi-media for instructional delivery. It can be delivered in textual, audio, visual and audio visual forms. The use of internet and e-resources are increasing worldwide day –to-day . The web environment is creating a new gateway for visually challenged people to access information quickly and easily without any barriers and support from others. Introduction of ICT has impacted traditional education system of Visually Challenged Students.[6]

V ASSISTIVE TECHNOLOGIES FOR VISUALLY IMPAIRED

The term adaptive technology is often used as the synonym for assistive technology; however, they are different terms. Assistive technology refers to "any item, piece of equipment, or product system, whether acquired



commercially, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities.” While adaptive technology covers items that are specifically designed for persons with disabilities and would seldom be used by non-disabled persons. In other words, "assistive technology is any object or system that increases or maintains the capabilities of people with disabilities," while adaptive technology is "any object or system that is specifically designed for the purpose of increasing or maintaining the capabilities of people with disabilities." [7]

5.1 How the blind and visually impaired read : Assistive Technologies

Computers and assistive technologies have caused a significant change for the blind and visually impaired in access to information. Assistive technologies involve synthesizer ((external hardware unit) or a screen reader (software) that read aloud text appearing on the screen. Differences between the Braille display and the screen reader are in alphabets that are used (Braille and common). Also, one needs to bear in mind that the Braille display accesses only one line of the text at a time, and does not caption the whole page on the screen. This largely influences the serial information seeking behavior of blind users. Braille embossers are another piece of hardware that enables the blind to have materials printed in Braille. An ideal solution seems to be software that does optical character processing of text on the paper put on the scanner and that immediately synthesizes speech, i.e. automatically reads a printed page. For the visually impaired there is also screen magnification software. There are three main types of workstations adjusted for the visually impaired: 1) a completely closed system: one integrated hardware unit comprising of all necessary components (scanner, keyboard, computer); 2) a semi-open system: PC components that are not integrated into one hardware unit, but are separated; and 3) an open system: a typical PC with software for the blind (Internet support for a blind Internet user).[8]

The main downside to these units of equipment is its expensiveness. Another problem is with minor languages for which text-to-speech software is low-quality or still nonexistent. For the Croatian language the development is underway (Internet support for a blind Internet user). Accessible Web Sites, Online library catalogues and digital collection for visually impaired.[9]

Consequently, adaptive technology is a subset of assistive technology. Adaptive technology often refers specifically to electronic and information technology access. Libraries are also taking advantage of advances in ICTs to increase information access for the visually impaired. A broad range of ICTs otherwise called adaptive or assistive technologies are now available to provide access to information in electronic database and on the internet giving blind users equal opportunities’ as the sighted. These innovative technologies include.[3]

a. Screen Magnifier:- This is a software that allows text or graphic on computer screen to be magnified up to sixteen time the original size.

b. Screen Reader:- A software that reads out the content of a document to the reader.

c. Voice Reorganization Software:-This allows the user to input data into the computer by voice.

In the context of Library and Information centers (LICs) are playing an important role in extending the required latest information services quickly to their users..In 1990s and from2000 onwards, Internet access and Consortia approach of journals subscriptions diversified the availability of electronic information. Presently many libraries in India have provision to access the same Information Technology in multiple ways for Visually Impaired people.

Lucky and Achebe (2013) described, the assistive technology devices include:

(i)Screen reader: Software program that works in conjunction with speech synthesizer to provide verbalization of everything on the screen including menus, text and punctuation. It gives persons with visual impairment direct access to the world of print. It also creates independence in reading to the visually impaired. It helps a blind person to read freely at his/her own pace without assistance.

(ii)Braille translation software: Translate text and formatting into appropriate Braille characters and formatting.

(iii)Braille embosser: A Braille printer that embosses computer generated text as Braille on paper.

(vi)Closed circuit television: Magnify a printed page through the use of a special television camera with a zoom lens and displays the image on a monitor.

(v)Braille embosser: A Braille printer that embosses computer generated text as Braille on paper.

(vi)Scanners: Device that convert an image from a printed page to a computer file. Optical Character Recognition (OCR) software makes the resulting complete file capable of being edited. With the help of ICT, the visually impaired have been rendered special attention to fully participate in the world by providing them with best possible support necessary to bridge gaps between accessibility and literacy. More importantly, careers in science are now within the reach of the visually impaired and some of them have become successful in many scientific fields, including engineering, physics and chemistry.[10]

VI INFORMATION RESOURECES FOR VISUALLY IMPAIRED

6.1.Braille Books Braille means a form of written language for blind people, in which characters are represented by patterns of raised dots that are felt with the figure tips. Books writing and printing for blind or Visually Impaired people use Braille Language.[12]



Fig-1

Braille Scanning software –OBR (Optical Braille Recognition): It is a windows software program that allows you to read single and double sided and double sided Braille documents on a standard A 4.Scanner. It scans the Braille document, analyses the dot pattern, and translates it into normal text that it presents on the computer screen.

Index Basic Braille Embosser: It is not costly, high speed, Double sided Tractor feed continuous sheet, new

generation technology Braille Embosser. There are some important features are: it produce 2pages i.e., front and back at the same time ;uses Tractor feed paper which can be spiral bound using plastic wire making it very economical; does not require any special binding equipment; supplies with an acoustic cabinet. It also enables collection of the paper in an orderly manner.



Fig-2

6.2.Talking Books. (These are audio versions of books that could be recorded on cassettes, CD-ROM, DVDs and on the internet as e-books. These books are preferred by the majority of the Visually Impaired.

6.3.Jaws(Job Access with speech) talking Software: It is conversion of a normal PC into talking PC to enable the blind internet Access and also to train blind persons on using the computer.

6.4.Magic Magnification software: useful for enlarging the screen from 2x to 16x enabling low vision students to view the monitor screen as well as use the add-on support tools for enhancing visible.[11]

6.5.Talking Typing Teacher Pro: Talking Typing tutorials specially designed for the blind complete guidance and practice lessons for learning keyboarding skills and developing typing speed in a systematic manner. Since the program also has a complete display of all lessons, even the low vision students can read and learn to type.

6.6.Zoom-Ex Instant Text Reader: It is a small portable that uses the new generation motion sensor technology in combination with its proprietary zoom office software to make scanning and instant reading of text fast and easy. Place a book under the highly sensitive camera and start reading or listening instantly and that too with an Indian accent voice and with every turn of a page automatically. It then converts these photographic images to readable text. A book of 200pages is read in 8minutes, Now read it at your own pace for long hours.[11]

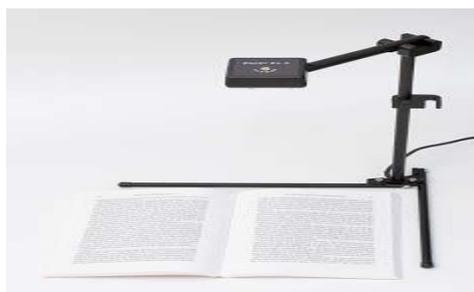


Fig-3

6.7.Freedom Scientifics SARA(Scanning and Reading appliances) :SARA is the next-generation self-contained scanning and reading appliance for people who are blind or have low vision. SARA is simple to use, and quickly converts printed text to spoken text. No computer experience is needed. Read your documents without the need for sighted assistance. Easy to learn, easy to use - no computer experience needed. Convert printed text to human-like speech in your choice of voices and languages. Built-in keypad with brightly-colored tactile keys and an audible menu .Add a monitor for a complete low-vision scanning and reading appliance. Powerful low vision features tailor the appearance of text on the screen, including font style, size, character spacing, and colors. Fast, automatic page capture for efficient document acquisition. Save files in SARA or send to a USB thumb drive.[11] .There are some salient features:

- (I)Simple to use – no technical experience needed
- (II)Built-in Braille display support
- (III)Scans and reads documents of many sizes
- (IV)Identify denominations of US paper currency with the Buck Scan function
- (V)Human-like reading voices you can customize for your preferred voice rate and volume
- (VI)Intuitive Help button describes every button’s function
- (VII)Save files to CD or USB thumb drive
- (VIII)Includes a classic literature starter Library
- (IX)Read DAISY-format books
- (X)Save files to and from CDs or USB thumb drives [13]



Fig-4

6.8. Angle, Pro.(Like Mobile Apparatus): Angel PRO is a talking assistive technology device specially designed for the visually challenged that could be utilized in digital library to issue and read the e-books in various formats including DAISY. There are some salient features are:

Supporting various formats: It is a pocket size device, hat could be used to play & read various formats such as:

- (a)DAISY PLAYER: Reads all Daisy books including those prepared in the latest Daisy 3 format. Provides easy navigation for Go to Page, Headings, with levels for chapters, sections, phrase as well as beginning of book ,end of book, time intervals, etc.

(b)E-BOOK READER: Reads all books, documents or files saved in Text, Word, PDF, E-Pub, HTM or HTML formats in a clear human like voice with a choice of 2 voices – Male Joseph and Female Mary.

(C)EASY NAVIGATION AND READING: Navigate through e-books and browse through them page by page, sentence by sentence or just read the entire book.

(d)MUSIC PLAYER: Plays all music or audio files saved in MP3, WMA, WAV, FLAC, APE, AAC, OGG, RA, M4A formats. And so on.[13]



Fig-5

VII CONCLUSION

Technology is important for visually impaired people. Even though most of the students are computer literates they are not enjoying the benefits of ICT, due to the unavailability of resources. Whether the visually impaired are aware to these advanced technologies and whether these service provided by assistive devices are reaching them properly. Today the tendency in libraries is to open their services to all, providing library materials in accessible formats such as digital, audio. But also large print and Braille formats, developing electronic library catalogues of these materials on the World Wide Web, ensuring on-site workstations equipped for the Visually Impaired people as well as developing other library services. Technologies play a great role in fulfilling the information and educational needs of the visually impaired people. Therefore efforts need to be done for improving the Visually Impaired in society. Therefore, serious efforts need to be done by the libraries/institutions/NGOs for these neglected groups of special people in fulfilling their information needs. However, through this small study, an attempt is made to touch the lives of the visually impaired people and their information needs, Information technology brings awareness to the Library & Information Science Professionals and others.

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