Digital reference service for the people with special needs: What, why and how?

Udayan Bhattacharya
Department of Library and Information Science, Jadavpur University, Kolkata, India.
E-mail address: udayanbhattacharya1967@hotmail.com

Avik Roy
Baksha B.N. Vidyalaya, Hooghly, India.
E-mail address: avikroy.h@gmail.com

Abstract:

Reference librarians truly enact the role of a connecting bond between information contained in documents and its users as well as beneficiaries. But when the occasion arises of providing personalized and reader's advisory service to people with special needs, they seem to have the ground snatched away at once since the majority of reference librarians find themselves unable to use their previous experiences. The present paper is an endeavour to seek the best as well as the easiest and most fruitful way of providing reference services to people with disabilities by incorporating Internet technology in the form of Digital Reference Service. It is accepted that most of the people who need either physical or psychological assistance face great hindrances in getting information at the right time. The search engine Google has some great offerings in the form of assistive technology to people, such as Chrome Browser's ChromeVox, Google Search through Google Voice etc. Mobile operating systems like Android have some special apps like Text-to-Speech etc. for the blind and visually impaired; similarly the iPhone has some apps like AccessTech, Proloquo2Go, iConverse, iCommunicate for people with visual disabilities. DAISY Digital Talking Book, Audio books, Books for the Blind (Talking Book) etc. are some possibilities for reference service for people with special needs. Organizations like Learning Ally (U.S) etc. are constantly making the information seeking better for people. The study reveals that Libraries and Information Centres should frame policies and should disburse a certain amount from their budget for acquiring adoptive and assistive technologies along with producing e-books complying with DAISY format for people with special needs, thereby securing their right to information.

Keywords: Reference service, digital reference service, people with special needs, visually impaired, hearing impaired

1 INTRODUCTION

Long ago, William A. Katz (1969) remarked, "If the users will not come to the library, the library must go to the users". This can be regarded, indisputably, as the guiding principle of reference service—traditional and digital -- in the twenty first century. When the occasion arises of providing reference and information services to people with special needs, the service methods of libraries seems to be stumbling and, to a great extent, unable to fetch the right information for people with disabilities. Despite a massive revolution in the technological sphere, librarians feel helpless in providing personal assistance, readers' advisory services and other kinds of services to people with either single or multiple disabilities. Much has been written about how to provide information seeking assistance to people with disabilities but during this study it's been found that they have yet to reach their utmost satisfaction in getting reference and information services from the reference librarians. There are several kinds of barriers for their accessing of information including physical and even psychological. The situation is very crucial for people with visual impairments or low vision and cognitive disabilities. Digital reference services like Ask-A librarian, Ask-the Librarian, Virtual Reference Desk, 24X7 Online Reference service, etc. incorporating technologies like Internet Relay Chat (IRC), Multi-user Domain Object Oriented (MOO), and the features of Internet and Web 2.0 are some of the potential tools to provide digital reference to these patrons. Since traditional libraries cannot offer the required infrastructure to serve them, libraries have started a journey from traditional to digital in order to accommodate such services. Digital reference services are one among so many such types of services that may help in people with special needs' information seeking and access.

2 DEFINITON OF DIGITAL REFERENCE SEVICE WITH ITS HISTORY

Janes, Carter and Memmott (1999) defined digital reference service as "a mechanism by which people can submit their questions and have them answered by a library staff member through some electronic means (e-mail, chat, web forms, etc.)." Digital reference service in the early 1920s has seen the incorporation of the telephone as a medium in answering queries. One of the first such services to go online was the Electronic Access to Reference Service (EARS), launched by the University of Maryland Health Services Library in Baltimore in 1984 (Singh, 2004). Again the use of some particular real-time software by different institutions like Multiuser Domain Object-Oriented (MOO) by Internet Public Library (IPL) from 1995 to 2000, Internet Relay Chat (IRC), developed by Jarkko Oikarinen in Finland in 1988 (Ronan, 2005), and more recent virtual-reality systems like Second Life can be named. Apart from using real-time chat software like IRC, MOO, and Instant Messaging, there are some advanced real-time software which are frequently being used like Blackboard (http://www.blackboard.com), eCollege (http://www.ecollege.com/index.html), etc.; some call centre software from vendors like eGain Live Web (http://www.egain.com), QuestionPoint Collaborative Reference Service (http://www.questionpoint.org), etc. are in vogue for providing digital reference services (Ronan, 2005). However, providing reference service to people with special needs goes back in 1991, when the New York University (NYU) for the first time in its history accepted a deaf and blind student for the fall 1991 semester (McNulty, 1992).

3 PEOPLE WITH SPECIAL NEEDS AND THEIR PROBLEMS

People with special needs have either single or multiple functional disabilities which can create great hindrances in their accessibility in day-to-day living. Heather Hill (2013) mentioned that approximately 36 million people in the United States have one or more disabilities. In Canada and Australia, the figures are 4.4 million and 4 million, respectively. People with physical disabilities are less likely than their able-bodied peers to have post-secondary education and are less likely to obtain meaningful employment. Libraries are known for leveling socioeconomic differences by providing resources to people who might not otherwise have access (Hill, 2013). Disabilities are "long-term physical, mental, intellectual or sensory impairments which, in interaction with various attitudinal and environmental barriers, hinders full and effective participation in the society" (United Nations, 2009, para 3). Terzi (2008) describes disability as "a phenomenon of the interface between personal characteristics of the individual and specific design of the social and physical environment that individual inhabits." Now, different literature shows endeavors are constantly being made to provide information-assistance to people with disabilities. Davis (2007) found that most of the research concerning people with visual disabilities focused on information technology, particularly on Internet accessibility.

People may have different kinds of disabilities such as a physical disability and a sensory disability which includes vision impairment, hearing impairment, olfactory and gustatory impairment, somatosensory impairment etc., a balance disorder, an intellectual disability, mental health and emotional disabilities, developmental disabilities, non-visible disabilities and multiple disabilities etc. However, the matter of our concern does not need to include all these types of disabilities instead we will focus only on those disabilities that would be in the scope of the study that pertains to the obstacles in getting information and reference service. Hill (2013) has keenly studied the literature published in the popular journals on different types of disabilities and saw that among all types of disabilities visual disability ranks first followed by learning disability and physical disability along with auditory, multiple and non-specific, general types of disabilities.

Burgstahler (1992) has categorized people with special needs as Mobility impairments, Blindness, Low vision, Hearing or Speech impairments and Specific learning disabilities and in every aspect there are three types of barriers for these people, Input, Output and Documentation. The experts interviewed during collecting primary data for the present study have provided some very crucial information regarding the information seeking behavior of people with disabilities. According to Expert 1, the disabilities of mental health can be of different types, such as borderline, profound, severe, etc. and a person with such disabilities may react to his or her surroundings according to the category he or she belongs to. Similarly, people with cognitive disabilities show a kind of inactiveness in expressing their needs and demands, and most of the time their communication remains difficult. Providing digital reference services to the people with special needs since, undoubtedly, accessing information is an intellectual process that needs at least a minimum kind of ability in everyday life information seeking processes. (ELIS) (Savolainen, 1995).

Computing technologies along with Internet can be blessings to people with special needs. Tasks such as reading and writing documents, communicating with others, and accessing information through the Internet etc. are now not a matter of shackles for them since they can handle these independently. Hardware and software technologies, namely adaptive and assistive technologies, are being constantly developed by organizations like American

Foundation for the Blind, Volunteers of America, and Learning Ally etc. Documents are being continually procured in some of the universal formats like Digital Access Information System (DAISY) etc. to fetch their required information as a counterpart of the printed one.

4.1 Visual impairment and low-vision

Libraries and information centres have the great scope of providing digital reference service to blind and low-vision people by employing the latest developments and discoveries of technology. Mobile access of information is now a revolution with the latest discoveries like Smart phones, Gadgets Phones, i-Pads, i-Phones, e-book readers etc. Mobile devices with Android Operating System based on apps (software application for mobile phones and usually available through application distribution platform and which are typically operated by the owner of the mobile operating system such as Apple App store, Google Play, Windows Phone Store, and Blackberry App World etc.) can open up new vistas for people with visual impairments. There are some apps in these stores that can handle speech input and give feedback as speech output and libraries and information centres can use this technology to provide services to blind users. They can create application software of their reference section and incorporate all the functions of this section in that application such as a list of reference documents in DAISY format or talking book format, access to these documents with the input of their speech recognition software, personal assistance and readers' advisory service in accessing specific type of information through different chat software like IRC, MOO, Web chatting etc. and information through screen reader software like JAWS etc.

Low vision people may find it difficult to decipher the information content from web pages because of their inability to properly identify the information on those pages. One of the best solutions for this is to create web pages with the zoom in feature of the texts of the pages. Low vision people seem benefit greatly from this kind of page since they can zoom in or out of texts on the page on their own. People who have colour blindness can benefit from web pages which are equipped with different colour features of the pages. For instance, the web page of the National Institute for the Visually Handicapped of India (http://nivh.gov.in), Office of the Chief Commissioner of Persons with Disabilities (www.ccdisabilities.nic.in), Ministry of Social Justice and Empowerment (http://socialjustice.nic.in) and its related sites are accessible with screen reader software like Screen Access For All (SAFA) (http://www.nabdelhi.org/NAB_SAFA.htm), Non Visual Desktop Access (NVDA) (http://www.nvda-project.org/), etc. If all web sites are built with such features for people with visual impairments and low vision, accessing information for them would not be too difficult. In providing reference service to these patrons in the digital environment, screen reader software is a pre-requisite. Screen reader software is very important for not only deciphering the texts from the web pages but also for the texts-to- speech system of most of the library. The libraries and information centres would have to acquire any of the above mentioned screen reader software along with their apps to provide reference service to these patrons fruitfully.

There are some organizations like German Central Library for the Blind, West German Audio Book Library for the Blind, Library of Congress, US and CNIB Library, Canada, Learning Ally, a non-profit volunteer organization in U.S., National Braille Library, India, National Talking Book Library, India etc. that are constantly procuring audio books or Talking Books for people At present more than 5000 public libraries offer free downloadable audio books which can be played using i-Pad, i-Phone, Mac-OS, Learning Ally software etc. Books for the Blind is a program in the U.S. which provides audio recordings of books in a proprietary

cassette-tape format, along with a cassette player supporting that format, free of charge to the blind or visually impaired people. Learning Ally in 2012 contained 75000 titles of audio books which can be played in mainstream mobile devices or Learning Ally software. The books produced by Learning Ally can be played on assistive technology devices like Plextalk, Humanware Stream, and Intel Reader etc. In a library, reference documents are purchased from vendors in order to provide reference service to the patrons of the library. Similarly, libraries should pay attention to the procuring of audio books required by patrons with special needs by communicating with the above mentioned organizations and making available these documents to them.

Google provides a novel browsing and searching facility for persons with special needs. Chrome Browser supports assistive technology including some screen readers and magnifiers. It offers people with low vision a number of tools like full page zoom and high contrast colour. ChromeVox screen reader offers an excellent experience of web applications to the visually impaired people. Google Search is extremely popular among blind users for searching and navigating on Web. Google Voice can transcribe one's voicemail to text message and then link transcripts to one's computer and mobile devices. Web Braille Library is another epoch-making concept to provide digital reference service to patrons.

4.2 Mobility impairment

Mobility impairment is that type of disability which includes one or more types of physical disabilities. Due to lack of proper coordination of the movement of the limbs of the body, people find it difficult to have movement. This was hitherto a great hindrance in getting information. Reference service in the digital environment does not mandate them to appear physically in front of the reference librarians to get reference services. Modern Asynchronous digital reference services (Singh, 2004) such as E-mail, Web forms, Ask A services and Synchronous digital reference services such as Chat reference, using Web content software, Video-conferencing or Web-camera services, Digital reference robots etc. along with Collaborative Digital Reference Services (CDRS) started by Library of Congress (LC) in 2002, OuestionPoint by LC and Online Computer Library Centre (OCLC), 24/7 Reference services (Singh, 2004) etc. are very beneficial to the people with mobility impairments. The online 'Discussion Forum' of LC can help them communicate with other people in a virtual environment and access information they require. However, libraries and information centres can make some modifications in their building structure including the availability of lifts, slope-ways for wheel chairs, and the availability of volunteers to assist them in order to make a smooth passage for people who want to avail the service from inside the library building.

4.3 Hearing impairment

Hearing impairment is the category of physical impairment that includes people who are completely or partially deaf. Google has a great many assistive technologies to offer for the hard-of- hearing or hearing impaired. Google+ Hangouts apps, Google SMS Application (available in Android Market), Google Translate Conversation Mode, Gmail Video Chat for sign language speakers and Google Drive for people with special needs are some of the most useful apps for people with hearing impairments. Since this kind of disability does not create any kind of serious obstacles in getting information, people with hearing impairments do not face as much difficulty as people with visual impairments. However, for any kind of audio guides and multimedia presentation regarding the library, it seems to be difficult to communicate with these patrons. However, some of the latest types of application software

like Tunewiki, SoundAMP, iHearClear available in Apple Apps Store turns an iPhone into a hearing aid. However, in communicating information with patrons with hearing impairments reference librarians may find it difficult to deliver referral as well as information service along with personal assistance and readers' advisory service. In such circumstance they can use iSign, a type of application for American Sign Language. It would be much better if the library pays attention to creating special resource persons among the library staff in order to help users with hearing impairments.

4.4 People with autism and developmental disabilities

Autism is a disorder of neural development characterized by impaired social interaction and communication and by restricted and repetitive behaviour. It affects information processing in the brain by altering how nerve cells and their synapses connect and organize; how this occurs is not well understood. The childrens' reference section of any library can procure reference books from Learning Ally etc. type organizations with pictures that may help in the cognitive development of any child. Digital reference service such as KidsAsk etc. should be developed so that children with autism may benefit from this. This type of service can be better performed if pictures and graphics are used with the specific purpose of providing reference service to children. Application software like Proloquo2Go, iConverse that displays six different icons that represent a person's most basic needs in audio and video form, iCommunicate etc. are great tools for these children. Similarly, libraries should develop software applications with iconic details of the reference section for the children's use and thus the child could be delivered digital reference service with some fruitful results. Software like IRC, MOO, IM etc. are very useful for people who find it a difficult task to ask for help from the reference librarians Such kinds of cognitive developmental problems can be handled with the above mentioned software and mobile apps.

4.5 Older people and children

Older people and children, in their information seeking, too, may need some extra attention from the libraries and information centres. Aged persons may face problems similar to those of low vision people. In such cases, their problems could be remedied with the same solutions like the zoom in feature of the browsers by which they can zoom in the text-elements of a web page and access their required information from the Web. Some aged persons suffer from hearing impairments and that can also be a hindrance for their accessing information. Hearing aids provided by the libraries for in-campus use can be of great help for their information accessing. Libraries and information centres should build web pages in such a manner so that people cannot find any difficulty in their information seeking of any type. Children with colour blindness want to have web pages in different colours according to their preferences and ease. So the web page of any reference section should provide the accessibility feature on that page with viewing facility in more than one colour. Digital reference services for children, KidsAsk type services are very popular, of late, among the children. American Foundation for the Blind provides some great services for seniors.

5 Problems in implementations
   a. In the course of the survey for the study, so many problems have been identified which truly reveal the reasons behind the failure of providing fruitful reference services to people with special needs in libraries in India. These are:Lack of service mindedness of the libraries and information centres;

b. Lack of expertise in the field of libraries and information science to work for people with special needs especially in those areas of utilising the communication technologies;
c. Lack of knowledge regarding the information requirements of persons with special needs;
d. Lack of proper financial support from the authorities of the academic libraries to provide infrastructure for people with special needs;
e. Isolation-treatment for people with special needs assuming that they can never be a part of the mainstream of life and hence that budget allocation is not necessary for them;
f. Dearth of knowledge in technological advancements which may be of great help in providing reference services;
g. Lack of knowledge in handling reference questions from the people with special needs that results in the failure of providing right information to the right people;
h. Less knowledge in sign languages for providing services to deaf people;
i. Infrastructural problems;
j. Unavailability of screen reader software like JAWS etc. in regional languages;
k. Unavailability of speech recognition software in regional languages;
l. Lack of knowledge of online chat software like IRC, MOO, IM,etc.;

CONCLUSIONS

Digital reference services are being provided by libraries in order to provide personal assistance to local or remote users of the library employing modern Internet technologies. People with special needs, indisputably, can be greatly helped by these digital reference services if applied properly with appropriate skills. Visually impaired and low vision people who have hitherto been deprived from getting the right information at the right time find these new type of reference services in the digital environment as a blessing since these enable them to seek information independently. Autistic adults as well as children can be greatly served with the latest developments in mobile technologies. Senior citizens along with children are greatly enriched in getting digital reference services from the libraries and information centres through mobile apps and other similar kind of technologies. However, there are so many research areas that remain still untouched such as:
   a) Information seeking behaviour of people with special needs;
   b) Everyday life information seeking (ELIS) of people with special needs;
   c) The other areas of libraries that can render services to people by employing ~~fruitfully the~~ modern technological advancements;
   d) Open source digital reference software that may handle regional languages;
   e) Cataloguing, classification and other type of technical processing jobs for the audio books, Web Braille etc.;
   f) Information retrieval system for ~~these~~ people with special needs;
   g) Digital reference tools for people with special needs;
   h) Media in the digital environment for people with special needs;

REFERENCES

Burgstahler, S. (1992). Working together: People with disabilities and computer technology. Seattle: DO-IT, 1-4.
Davies, J.E. (2007). An overview of international research into the library and information needs of visually impaired people, Library Trends, 55(4), 796-808.

Hill, H. (2013). Disability and accessibility in the library and information science literature: A content analysis. Library and Information Science Research, Retrieved from http://dx.doi.org/10.1016/j.lisr.2012.11.002

Janes, Joseph, Carter, D. & Memmott, P. (1999). Digital reference services in academic libraries. Reference & Users Services Quarterly, 39 (2).

Katz, William A. (1969). Introduction to reference work. McGraw-Hill Book Company.

McNulty, T. (1993). Reference service for students with disabilities: Desktop Braille publishing in the academic library. Reference Technology, 37-43.

Ronan, J.S. (2005). Chat reference. London: Libraries Unlimited.

Singh, D. (2004). Reference services in the digital age. Paper presented at the Conference on Library Management in the 21st Century, 29-30 March 2004, Philippines: Ateneo de Manila University. 1-8.

Terzi, L. (2008). Justice and equality in education: A capability perspective on disability and special needs. New York, NY: Continuum International.

Savolainen, R. (1995). Everyday life information seeking: Approaching information seeking in the context of "way of life". Library & Information Science Research, 17, 259-294.

United Nations (2009). What is a disability and who are persons with disabilities? FAQ: United Nations enable: Rights and dignity of persons with disabilities. Retrieved from http://www.un.org/disabilities on April 29, 2013.