Transformation of Reference Service to Digital Reference Service: Scholars Review in Context of Present IT Environment

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Abstract

Reference and Information services are the most important and indispensable component of modern library system. Internet has introduced new modes of communication and has extended the scope of reference service to Digital Reference services to the users across the world. The academic library reference service is undergoing a traditional to web based transition period. Modern reference service is committed to render a client focused service to end users. This paper highlights the emerging formats and models of modern reference service. Based on the literature review and practical experience of us, new research directions are suggested, in which user, paraprofessionals as well as librarians various interventions are integrated. An attempt has been made through this article to notify the significance of Digital reference Services as well as web based reference service in present IT environment and suggests the criteria for Planning and implementing Digital Reference Services in libraries. This article highlights various issues related to digital reference service and its application aspects, also examines the various needs before its implications.

. **Keywords:**   Reference Service, Digital Reference, Reference Model, Internet

1.   Introduction

The exponential growth of information in the World Wide Web and the number of users searching for information on the web sites is increasing day by day. The library and information profession is also facing the challenges of electronic age and been transformed by technology. Advancements in information technologies have brought out incredible changes in almost every aspect of information services. Reference services are also not an exception. Easily accessible digital information has rapidly become one of the hallmarks of internet. As a result, to cope with the situation traditional libraries have emerged with the tasks of massive digitization, storage, access,

digital knowledge mining, digital reference services, electronic information services, search co-ordination, and manage the archive and its access. The terms "virtual reference," "digital reference," "e-reference," "Internet information services," "live reference" and "real-time reference" are used interchangeably to describe reference services that utilize computer technology in some way or other.

2.   Traditional Reference Service

According to the American Library Association's Glossary of Library Terms, 'Reference Service is that phase of library work which is directly concerned with assistance to readers in securing information and in using resources of the library in study and research'. Ranganathan defines Reference Service as 'Personal Service to each reader in helping him to find the documents

answering his interest at the moment pin-pointedly, exhaustively and expeditiously.' Both definitions convey that reference service means 'process of establishing contact between a reader and his documents in a personal way'. 'His documents' refer to those who will serve his requirements precisely.

2.1 Elements of Traditional Reference Service

Essentially a reference service incorporates the following three basic elements:

2.1.1   Information or knowledge base

2.1.2   User or client-now likely to be a member of the new cyber-community in which the library operates

2.1.3   Information professional or librarian, who plays the role of intermediary assisting and advising the user in their information seeking.

3. Digital Reference Service

Digital Reference Service is only an advancement of the same traditional services which is emerging as natural solution to meet the users' information needs in the changing technological environment. Technically speaking digital reference refers to a network of expertise, human intermediation and resources placed at the disposal of users in an online environment. It employs automated tools wherever possible, allowing human experts to concentrate on 'hard questions'. Automated tools are less expensive to incorporate into online services and sites, allowing digital libraries to provide efficient and speedy services to its users.

There are various definitions of digital reference services provided by various library experts.

Lankes (1998) defines digital reference as Internet-based question and answer services that connect users with individuals who possess specialized subject or skill expertise.

Janes, Carter and Memmott (1999) developed their own definition of digital reference 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.) not in person or over the phone.

3.1 Elements of Digital Reference Service

A Digital reference service generally comprises the following elements:

3.1.1   The interface (e-mail, web form, chat, videoconference, etc.),

3.1.2   The information professional, and

3.1.3   Electronic resources (including electronic or CD-based

3.1.4   Resources, web resources, local digitized material etc., as well as print broachers.

3.2 Why Digital Reference from Traditional Reference

It seems to us that a properly comprehensive and scalable digital reference service needs to

3.2.1   Incorporate works from a broad range of publishers.

3.2.2   Provide a common searching interface to all the resources.

3.2.3   Deliver improved browsing possibilities to end-users.

3.2.4   Become more informative and more useful as more material is added to the service.

3.2.5   Facilitate selections of appropriate sources by librarians according to the constituencies they serve.

3.2.6   Enable the owners of copyright materials to extract a fair return from widely used and popular material.

3.2.7   Enable the owners of copyright materials to extract a fair return from material that is valuable but little used.

3.2.8   Interact and interoperate with other information services on the web print resources.

4. Modes of Digital Reference Service

Digital reference service models can be organized either in an asynchronous mode wherein the transactions involve a time delay between the question and answer and synchronous mode with instant answers to a query.

4.1 E-mail

E-Mail is most preferred means of communication in responding to user's reference queries as it is widely available and does not require extra software.

4.2 Web Forms

On par with E-mail, instead of sending mail directly, the users need to fill up the their query on the Web form like Ask A Librarian from a designated web site, where users must respond to specific queries in addition to asking their questions.

4.3 Chatting for Information query

The transaction involves in chatting in a split web screen: in one screen users type questions and can

instantly see librarians' responses; in the second screen, librarians can call up web pages or other electronic references where the required information can be found. Although chat reference is associated with the 24/7 service model,

4.4 Video-conferencing or web-cam services

Librarians and users are able to use both text and speech for reference transactions with visual element. Instead of a window for the textual exchange, there is a window in which librarians and users can see each other while conducting a face-to-face interview.

5. Current Trends in Digital Reference Service

The Library of Congress' Collaborative Digital Reference Service (CDRS) pilot, for example, explored the growth of cooperative systems worldwide in 1998. In 2002, Question Point—a collaborative effort from the Library of Congress (LC) and OCLC Online Computer Library Center, Inc. (OCLC) became the next generation of the CDRS3

5.1 Reference and Information Services on the Web

There are a number of web-based references and information services available free of charge and small fee basis. Following are some of the web-based reference services, which could be used by the library and Information centres.

5.1.1 AllExperts - (All subjects available free)

5.1.2 Askme - (All subjects available free).

5.1.3 Find/SVP - (Business - Fee based).

5.1.4 LiveAdvice.Com - (All subjects - Fee based).

5.1.5 Professional City - (Law, Accounting, Marketing - Fee based).

5.1.6 The Internet Public Library (www.ipl.org).

5.1.7 Information Please (www.infoplease.com).

5.1.8 Britannica (www.britannica.com).

5.1.9 Bartleby Reference (www.bartleby.com/ reference).

5.1.10 The Internet Library for Librarians (www.itcompany.com/inforetriever/).

5.1.11 Reference Desk (www.referencedesk.org/).

5.1.12 The Electric Library (http://ask.elibrary.com/redesk.asp).

5.1.13 Mediaeater Reference Desk (www.mediaeater.com/easy-acess/ref.html).

5.1.14 Xrefer (www.xrefer.com/).

5.2 Search Engine Reference Services

There are many search engines that are used now a days. Among these ask Jeeves is a common one**.** Ask Jeeves (www.askjeeves.co.uk) is basically a search engine. Ask Jeeves, a web based information service is quite useful for introducing reference services in digital libraries. Users can ask a question and get an answer right away or ask a question on a given topic. Then Ask Jeeves comes up with a list of questions on the same or similar topics; the user can select any of those predefined questions and

Ask Jeeves provides further answers. This is an interesting service and may be considered a useful model for reference and information services in digital libraries.

In addition to Ask Jeeves, "The Electric Library" is an excellent choice for a serious researcher in need of timely content from a wide array or otherwise unavailable sources and "Information please" is a tool for students and other researchers as an authoritative sources of facts and pointers for further investigation.

5.3 Digital Reference Services and Libraries

Some libraries have now begun to offer web based reference services and a number of projects have been initiated. Some of such services available now are –

5.3.1 Ask a Librarian (www.earl.org.uk/ask/): A web based reference service primary design for UK residents, provided by a network of public libraries. E.mail response is sent by one of the participant libraries.

5.3.2 British Library STM search service and special reference services for business, patent, scientific, technical, medical and environmental information.

5.3.3 Ask A Services (for academic libraries).

5.3.4 WebLine (www.webline.com/products/ web.htm).

5.3.5 Virtual Reference Library (VRL) at Toronto Public Library.

5.3.6 CDRS (www.loc.gov/rr/digiref/): This collaborative Digital Reference Services has been launched by Library of Congress. It is a professional reference service to users, anywhere anytime, through an international, digital network of libraries.

5.3.7 Automatic Reference Librarians for the World Wide Web. (www.fastlane.nsf.gov/servlet/ showaward?award=9874759): Initiated by the University of Washington. In this web based reference service, the searchable site gets a wrapper containing some assigned topics that are used for matching with the topic of user queries.

5.3.8 SIFTER (http://sifter.indiana.edu/): Initiated by Indiana University.

5.3.9 The Virtual Reference Desk(www.vrd.org/) :sponsored by US Department of Education. Here when users question cannot be answered by participating centre, it is forwarded to the VRD network for assign.

5.3.10 AskUs Online Reference

(http://infopoint.lib.umn.edu) University of Minnesota Libraries offered to qualified public services staff.

6.   Current Challenges for DRS

With the introduction of IT in reference service libraries as well as librarians are facing several challenges it the implication of DRS. we can identify these challenges as below.

6.1 An ideal Management Software that would support Web-based reference services to have asynchronous and real-time interaction and telephone and site-based, face-to-face reference and facilitate the exchange of digital content; provide centralize the environment as needed. The success of realizing goal for achieving complete and seamless integration of digital reference operations largely rests on the integration of Management software of DRS.

6.2 The casual approach of Librarians will be totally ruled out when DRS is introduced in web environ. Therefore, an exclusive reference Librarian is to be appointed to respond the queries and chat instantly all the time.

6.3 Up-gradation of educating and training to handle the system of Digital Reference Service in using management software and responding is the basic necessity. This is the best opportunity to reveal the skilled Librarianship to explore their visibility.

6.4 Virtual Digital reference service will invariably grow even in the absence of aggressive promotion, but the real challenge is to demonstrate effective and high-demand service for the primary user community.

6.5 Co-operation and coordination is very much required from all angles i.e. Cross-institutional service collaborations, commercial information service development, and the development of tools and user interface designs that foster independent use of digital content for the success of Digital reference service.

7.   Visual Changes in Reference Models

The term reference service has duel meaning. By reference service we mean a variety of activities, with assistance to readers including selection, liaison activities, bibliographic instruction and implementation of electronic products. Information service emphasizes on providing exact information to the user in anticipation or in demand and denotes non-traditional approach. There are two aspects of information service. These are:--

❖   Provision of information on demand

❖   Provision of information in anticipation

The most common and obviously recognized weakness of the traditional reference service is that it works best for directional questions, while complex and in-depth questions are handled often briefly and superficially. According to some specialists this is because of unsystematic arrangement of the reference desk. Another disadvantage is that continuous rotation of staff , which discourage the user to continue the consultation. Whitson thy summarized the disadvantage of traditional reference service model as follows: high cost, lack of control, inflexibility in use of staff, lack of accountability, reinforcement of unrealistic client expectations, duplication of effort, and reinforcement of the image of librarian as clerk.

Numerous practitioners has put forwarded many alternative models of reference service. The alternative model which is also known as tiered service model, here reference desk is divided into two or more service points, differentiating complex or in-depth service from simple question answering. Technological change is the main driving force for emergence of alternative service models.

"Information desk" is another commonly used reference service model, which is staffed by paraprofessionals to filter out simple reference queries and refer reference question to reference librarian.

"Research consultancy model" is a model , which takes information desk model one step further by eliminating the reference desk entirely and establishing an "information desk" and a "research consultancy service office"

Whitson proposed a model which divides reference service into five categories: directions and general information, information lookup for the clients, technical assistance, research consultation and library instruction. This model has not yet been implemented by any library.

8. Changes Caused by Technological Invention

Significant change in reference librarianship had been brewing for some time before the introduction of the World Wide Web in 1995. The 1980s and early 1990s saw this change express itself in debates such as "mediated versus unmediated online searching"; "access versus ownership" and "print versus electronic"; and professional concerns that gradually widened to include electronic licensing and consortial collection development. The Web introduced new possibilities and additional interactive technologies such as e-mail, chat, and instant messaging to the reference desk; however, the effort of keeping current with the pace of change in technology and tools can redirect focus from services and patrons to tools, and make the process of gathering information and assessing tools to arrive at an informed decision more difficult. Within this context of digital reference, the pace of change and new interactive technologies often dominate the discussion rather than the library's service goals and the appropriate roles technology plays in supporting these goals. This discussion of technological challenges associated with digital reference does not focus on which interactive technologies support the reference interview, but on challenges libraries face in establishing and supporting an efficient, patron-focused digital reference service, based on library values. Gorman

summarizes the eight central values of librarianship as stewardship, service, intellectual freedom, rationalism, literacy and learning, equity of access to recorded knowledge and information, privacy, and democracy [Gorman, 2000]. Against this backdrop, libraries encounter wave after wave of technological innovations, each offering new options, features, opportunities, and potential distractions. Libraries face the ongoing and sometime paradoxical challenges of keeping up with these changes, implementing the new technologies, and maintaining a perspective on the technologies in relation to the libraries' work and core values.Janes sums up the challenge of conducting reference services in an increasingly digital environment in this way: "All professions and sectors must pay greater attention to how ever-rising connectivity and the digitization of resources are affecting their work, their professions, and the communities they serve" To this end, it becomes critical for libraries to understand the current technological landscape and to have an articulate vision of the customers or patrons they intend to serve. Without this clarity, technology rather than vision and needs may end up with driving change.

9.   Change in Reference Service Model

Improvement in technology has led to the development of different types of reference in last two decades. Despite of all advantages and disadvantages users can get reference help quickly and remotely. They can use reference services whenever they like. The library can use this service to attract the new users. The types of reference in context of modern developments of technology are: Email reference services, web forms, chat reference, VOIP, Video conferencing.

The general process model known as asynchronous model is used commonly by various academic university in modern times. The diagrammatic representation of this model is as follows:-
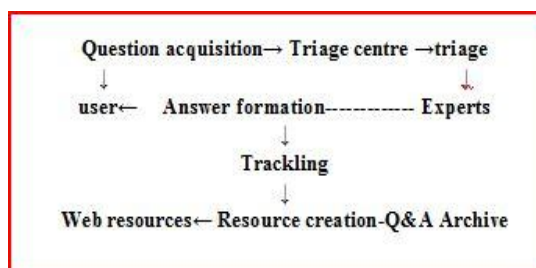

Figure 1: General model of digital reference service

[Source: Porentz,Jeffrey et .al."The current state of digital reference services",IN: Information processing and management, vol 40(2), 2004: pp 349]

An example of implementation of new model is by library of congress CDRS model. Library of Congress, have a rich tradition of collaborating to get work done have implemented a modern model of reference service named conceptual model for reference service. They have borrowed collection items from one another and used one another as service models. By linking libraries for reference services, the CDRS would combine the power of local collections and staff strengths with the diversity and availability of libraries and librarians everywhere, 24 hours a day, 7 days a week. There would always be a librarian available to provide to users located anywhere the interchange and experience of trained assistance in providing access to collections and resources both analog and digital. The graphic below provides an idea of what this network system could look like:
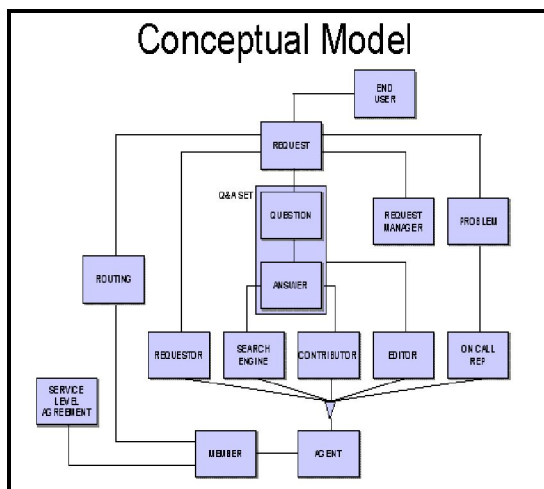
Figure 2: CDRS Model of Reference Service in Library of Congress

10. Issues Related to Implementation of New Reference Service Model

The main issue rises here is to focus on the number of the desks the reference section of a library to maintain and proper distribution of information in a systematic way so that the target group is benefited utmost by the service provided to them. According to some authors a new name for reference librarian and a new model for reference service will be satisfactory solution for the type of changes that reference service is experiencing. However change in technology has made reference service a complex phenomenon. Reference service model involves users, managers, change in reference environment and evolution of new reference model, these points should be under consideration and should be investigated. The change in the whole scenario of reference service environment has made the library professional made think some points necessarily before providing the service which are-

❖ Librarian's role in support of reference service in changing environment.

❖ Ways to treacle the change in profession and working environment.

❖ Development of new service model to improve users' search process.

11. Changing Role of a Reference Librarian

To meet that need, libraries must adapt our traditional strengths of acquiring, describing, and serving information to an environment that is not bound by time or physical place, the virtual library without walls. So how do we take the reference desk to cyberspace? Librarians organize information using controlled vocabularies and other standards tools to make materials accessible. Librarians evaluate materials carefully before selecting them and according to documented policy statements and guidelines. Libraries have both digital and analog collections which are regularly mined by highly skilled and trained subject, language and navigation experts. Finally, the communications options for libraries have been increasing in number and variety. People can conduct research and ask questions in person, in writing, by phone and fax, and online by email, and experiments using chat rooms and video conferencing have begun. By applying the best of what libraries and librarians have to offer (structure and organization, in-depth subject expertise, and analog collections) to the labyrinthine universe of unstructured and unverified information on the Internet, we can begin to bridge the gulf that exists between providers and users of information. The Collaborative Digital Reference Service (CDRS), currently being launched by the Library of Congress and its partner libraries, provides just such an opportunity to connect users with accurate, timely, and credible information anytime anywhere. As originally envisioned it would start small and grow

into a vast international service that would allow libraries to help each other serve all their users, no matter where the users would be. From the beginning, we had expressions of interest from all types of libraries around the world. The environment in which librarians work is changing in terms of greater access to a range of information, increased speed in acquiring information, greater complexity in locating, analyzing and linking information, constantly changing technology and adaptation, lack of standardization of both hardware and software, continuous learning for users and staff, management of financial investment for technology. The question of role of librarian in the new environment of exponentially growing Internet and World Wide Web has been addressed by a number of authors. On one hand, it has been postulated that librarians would play a more dynamic role than past .At present librarian can work as guides to the information seekers in the exploding universe of information. In another way, the rise of digitized information is an opportunity to elevate the role of librarian and leads to the emergence of a new breed of librarian : "The Cyber Librarian" or "Cybrarian" - a specialist in locating information on the Internet (Hathorn, 1997). At the extreme of the spectrum, on the other hand, total obsolescence and eclipse of library professionals in a scenario where knowledge base is diversified and wide and the developments in the fields like Artificial Intelligence, Neural Networks result in powerful, cost effective, user-friendly search strategies and methods (Brodie, 1995).The future scenario, however, may not be near any of these extremes. This is apparent from the facts like the information quantity has enormously increased and codification and classification of this information to facilitate easy

location is best done now as well as in foreseeable future by the librarians. The familiarization with new gadgets and methodology of locating information for vast majority of population requires guides and librarians can easily fit into this role with training. The leveraging of the available information to suit the needs of the clientele is also best done by the librarians.

12. Conclusion and Further Study

Technological revolution has changed the whole concept of reference service and environment. Exchange of information is fastening and user community today want pinpointed and accurate information with no waste of time. Librarians are the personals and experts, On the part of document and information delivery librarians are experts and occupies a central role in that revolution. Along with traditional methods of reference, virtual reference opens up new avenues of communication and enables us to connect with a new generation of Web 2.0 patrons. IM and embedded chat Facilitate quick, effective communication and can he improve customer service. Technological developments have affected not only the format and sources of the information libraries use to provide reference service, but also where we provide reference service. Libraries and their resources have thy partially moved to the virtual world of the Internet. As a result, library patrons can access the resources from outside the physical library also. In an effort to provide patrons access to a library via their computers, many libraries and library consortia are extending their reference service to include virtual reference. Technology now allows users to submit their questions the library at any time from any place in the world. Virtual reference is responsive to patrons' need for convenient access to reference

service. IM is definitely the way forward for online reference service, the positive aspects of IM are that it is relatively easy, cheap to setup, flexible, and so can respond to changes in technology and the user's habits.

Review of different literatures suggests that it is important to develop motivational strategies such as in-service training program for paraprofessionals who suffer from identity crisis but occupies a important rather we can say central position in providing reference service. It is also important to articulate goals and identifying the scope of reference service to clarify ambiguity and bridging between paraprofessional and librarian. A distinction between simple directional and complex instructional enquires should be reconsidered in tiered service models because users inquiries can better be understood on a need basis rather then question basis. It seems that till now most studies on service models follows a definite sequence i.e. Development and implementation of reference model'! listen to users' reaction'! to report the experience

However to provide effective reference service, further studies on this subject plus studies on reference service model is needed so that the advance reference service can be provided keeping in mind the latest developments in each and every field of knowledge. Surely and certainly the reference service area must continue its effort to be a linking point between information source and client. The ultimate goal of reference service is to understand users' information seeking behavior and to support those behaviors.

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