

Virtual Reference Service: Understanding Trends through Review of Literature

Atasi Sinhababu*

Abstract

Literature reviews are systematic syntheses of previous work around a particular topic. Nearly all scholars have written literature reviews at some point; such reviews are common requirements for academic writings, are often the first section of empirical papers, and are sometimes written to summarize a field of study. Given the increasing amount of literature in many fields, reviews are critical in synthesizing scientific knowledge. A literature review is a systematic explicit and reproductive method for identifying evaluating and interpreting the existing body of recorded work produced by researcher's scholars and practitioners. (Fink, 1998, p.3)

The review of the literature for this study focuses on virtual reference service (aka digital reference service) as discussed by different authors in their scholarly writings. The emphasis has been made to cover the scope, research methodology, major findings, and suggestions or recommendations put forward by the authors

Keywords: Virtual Reference Service (VRS), Digital Reference Service (DRS), RUSA, Review of Literature

Introduction

Reference service is a contact between the right reader and the right book at the right time and in the right personal way (Ranganathan, 1999). The reference service is crucial in libraries and information centres as it enables librarians to meet the information needs of information users (Chowdhury, 2002). With the passage of time, advancement of technology and affordable ICT infrastructure the libraries have evolved from the traditional set up to the digital environment. Librarianship in this digital era combines the long-established discipline of library science with computer science and information retrieval (Dollah, 2006). As library users are growing more

sophisticated and technologically equipped, librarians are striving harder to be a part of the users' worlds by being available wherever they are (Yang & Dalal, 2015). Libraries have invested an enormous amount of fund in digital products and services, and to ensure that this fund is not wasted, reference librarians have had to modify old, more traditional reference strategies to help users take advantage of these new tools. Besides learning new techniques, reference librarians are also getting involved in creating systems and content that enhance the user's research experience (Cannon, 2005). Katz (1969) has rightly pointed out that "If the users will not come to the library, the library must go to the users". In context with reference service, one of the best ways for the library to go to the user is Virtual Reference Service (VRS) which is also used interchangeably with Digital Reference Service (DRS). Not only, it can address queries which are general in nature but also, help users in utilizing the library resources in a better way. According to Moyo (2002), one way is to offer value added services such as digital reference services and web-based instruction to support remote access and navigation of library electronic resources. In addition to this, users can expect answers to their research based queries. Although users may be capable of using a search engine to answer simple fact-based queries, users may still have difficulty sorting through the results of a research-based query, and this is where virtual reference steps in (Numminen and Vakkari 2009).

Reference services have been constantly developing from the traditional, to automated, to hybrid, and now to digital. Technological innovation has played a key role in reference librarianship in the second half of the twentieth century. Telephone service began to appear alongside traditional face-to-face and postal reference services

* Research Scholar, Department of Library & Information Science, Panjab University, Chandigarh, India.
Email: atasi@pu.ac.in

early in the twentieth century (Bopp, 1995). In the 1960s, libraries began to explore new technologies such as microfilm and microfiche, tapes and sound recordings. The 1970s and 1980s brought about significant changes with the emergence of full-text databases and electronic card catalogs in many academic, public, and special libraries (Grohs, Reed, & Allan, 2003). The e-mail was first used by librarians to communicate with one another and, soon, with users as well. In 1984, the University of Maryland Health Sciences Library and the Health Science Library at the University of Washington developed a service called Electronic Access to Reference Service (EARS), which provided reference assistance via e-mail (Still & Campbell, 1993). Digital reference evolved from basic e-mail correspondence to more sophisticated systems that allowed librarians to show search results to users. One of the first projects was "See You See a Librarian" developed in 1996 by Eric Lease Morgan. The purpose of this service was to investigate the possibility of providing chat communication between librarians and possibly between librarians and patrons. By the end of the 1990s, several companies began to develop software for reference applications. LSSI (Library Systems & Services) was one among the first pioneers in this field and presented the first digital reference service software at the ALA conference in 2000 (Oder, 2001). In 2002, the Library of Congress with OCLC developed Question Point service, a collaborative reference service (Question Point, 2002).

"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" (IFLA, 2002). Joann M Wasik (2003) has defined VRS/DRS and AskA services as Internet-based question-and-answer services that connect users with experts in a variety of subject areas. According to him in addition to answering questions, experts may also provide users with referrals to other online and print sources of information". VRS/DRS expand reference services from the physical reference desk to a "virtual" reference desk where the patron could be writing from home, work or a variety of other locations. The virtual reference includes the use of both synchronous (i.e., IM, videoconferencing, etc.) and asynchronous communication (i.e., texting, email, etc.). Here, "synchronous virtual reference" refers to any real-time computer-mediated communication between patron

and information professional. Asynchronous virtual reference is all computer-mediated communication that is sent and received at different times.

According to RUSA guidelines (2010), Virtual reference is reference service initiated electronically where patrons employ computers or other technology to communicate with public services staff without being physically present. Communication channels used frequently in virtual reference include chat, video conferencing, Voice-over-IP, co-browsing, e-mail, and instant messaging.

Review of Related Literature

Lankes (1998) in his paper "AskA's: Lesson Learned from K-12 Digital Reference Services" showed that greater access to the Internet and World Wide Web had resulted in significant impacts on reference services. The nature of collection, service and information organization had been changing rapidly. The author discussed several techniques and initiatives occurring in the K-12 AskA community that is directly relevant to library and information centres seeking to build and maintain digital reference services. It is in the area of software development that K-12 digital reference services can contribute the most. The analysis outlines some of the thinking in this area as it relates to K-12 Digital Reference Services (AskA services). These services answer thousands of questions every week and had addressed many issues involved in providing human intermediated information and referral services via the Internet.

McClennen and Memmott (2001) in their paper entitled "Roles in Digital Reference" have described a model that delineates five roles involved in the digital reference process and have described some of the aspects of each role. Compared to traditional desk reference, the digital environment presented novel challenges. However, it also allowed for increased efficiency by letting staff members focus on one aspect of the job at a time. The study found during the course of developing digital reference service that the language used to discuss traditional desk reference was simply not adequate to describe the separation of roles in a new and more complex domain. The authors hoped that the new model would provide a basis for further discussion and research about the process of digital reference and would also provide a framework upon which decisions about digital reference practice can be made. The authors experienced that running a

successful DRS depends on upon having clearly defined policies and procedures that were well understood by all the participants. By framing these policies and procedures in light of these roles and the interactions between roles, one can ensure that all necessary aspects of the service have been covered and that everyone knows which roles they have been assigned to play.

Broughton (2003) in his research article entitled “Usage and User Analysis of a Real-Time Digital Reference Service” presented the results of a use analysis and the results of a user survey of Bowling Green State University Libraries’ “Chat with a Librarian” service for the academic year 2001-2002. A survey method was employed for the study. The study was based on user analysis and user survey. Moreover, information examined included when and from where users asked questions via the services, how users found out about the service, and what types of questions the users asked, the status and affiliation of the users, and user satisfaction with the service. The findings revealed that digital reference services were appreciated by the users and that many of them found reference transactions to be highly satisfactory. The author concluded with the curiosity in mind that why users, especially users in the library, would pick a digital reference service over the librarian at the reference desk and was there a relationship between why users would select digital reference over in-person when they were present in the library and why they were so satisfied with the digital reference service?

Penka (2003) in his article entitled “The Technological Challenges of Digital Reference: An overview”, much has been written about the various tools for digital reference, technical issues associated with their implementation, and the potential for these tools to reach new patrons. In this article, the study focused on the need to understand the technical environment within which digital reference occurs, from issues of patron definition and access to the role of cooperative relationships and networks in meeting the shared needs of librarians and patrons. The author provided an overview of reference environment along with data and practical examples from services like Question Point, the Library of Congress, and Ask Joan of Art® to demonstrate the importance and effect understanding audiences, appropriately using technology, and working cooperatively can have for libraries in digital reference.

Sharma, Kumar and Singh (2004) in their paper entitled ‘Digital reference is an emerging trend of traditional

reference service’ highlighted how the new face of service evolving as a natural solution to keep pace with the multifaceted technological environment. They also discussed the basic concepts and essential elements of reference service and gave in detail the advantages, limitations and the technology base about the various established and emerging forms of digital reference. The authors also discussed the various software available for DRS. They also threw light on collaborative digital reference service. According to the authors, information professionals are required to cope up with the new technological changes, but at the same time, one should not fear that the new emerging technology-based services will replace the traditional services completely rather these were emerging as supplementary services to improve the information dissemination amongst the user community.

Sen (2004) in her article “The Social Life of Digital Reference: What the Technology Affords” opined that digital reference service (also known as virtual reference) became a contentious topic in the library literature, as some critics felt that it threatened reference service more than it enhanced it. Through this paper, she hoped that the debate can be refocused after a careful assessment of what exactly digital reference technology can afford and what social impact such affordances could bring. She suggested that digital reference should be employed as a means to provide reference service as long as the service is designed to play to the strengths of the technology.

Pomerantz (2005) in his paper entitled “A Conceptual Framework and Open Research Questions for Chat-based Reference Service” focussed on theoretical frameworks to unite standards and best practices. The author explored the various steps in the process of providing synchronous, chat-based reference, as well as issues involved in providing such service at each step. In his article the author presented some open research questions at each step in the process of providing chat-based reference service. In this paper, a model of the provision of chat-based reference service has been developed. The author claimed that the model may serve as a conceptual framework for future discussions of and development of applications for chat-based reference.

Carraway and Payne (2005) in their study entitled “Implementing RAKIM open source chat reference software” highlighted the conception, implementation, and status of the RAKIM open source chat reference software at Midlands Technical College.’ The authors

came to know that for software implementation required time was only 3 days and required no help from the campus information technology (IT) department. The server setup was not hard because the procedure was so well-documented that the RAKIM software was installed in about 2 hours. They also found that librarians were able to practice with the software for almost 2 months before the system went live. Librarians were able to make changes to routine configuration as needed. As RAKIM used well-known open source software with significant documentation available on the Web, the system could be maintained with little difficulty.

De Groote, Dorsch, Collard, & Scherrer (2005) in their article entitled "Quantifying Cooperation: Collaborative Digital Reference Service in the Large Academic Library" tried to determine how successfully a large academic library with multiple reference departments and subject specialties could combine virtually to create one digital reference service. Questions were coded to determine who the users of the service were, the types of questions being asked, and the subject expertise of the librarian answering the question. The study found that the majority of questions were submitted by persons affiliated with the university, that ready reference and directional questions were predominated, and that the librarians were able to successfully share the duty of answering the general reference questions while ensuring that the questions requiring subject expertise were answered by the appropriate subject specialists. Analysis of the types of questions will inform future decisions regarding webpage redesign, online instruction needs, and more appropriate FAQs (frequently asked questions).

Roesch (2006) in his paper entitled "Digital Reference Services: State of the Art in the Focus on Quality" outlined the prevailing role of digital reference services within the information society. The paper continued with an overview of the developmental stage of relatively new service that has been reached so far. Advantages and disadvantages of the diverse variants had also been discussed. The author briefly demonstrated why quality criteria are important in the context of digital reference and how such criteria can be developed methodically. These criteria have to relate to the various forms of digital reference, be able to satisfy the specific requirements for collaborative reference, and allow for the diverse range of question types. In the final part of this paper, the author focussed on the quality criteria that can be used

to evaluate and improve digital reference services in practice. At the end the author concluded by giving seven main categories of quality criteria for digital reference namely Organisation of the reference process, Efficiency, Breadth / Extent of the service, Communication process, Quality of the answers, Usage of the service and Methods for evaluation. Only this will allow libraries to analyse and compare statistics in a meaningful way that will result in continuous evaluations and improvements in the services. The author felt that developing and applying these criteria would involve a considerable amount of work which would, however, pay off in the long term.

Hill, Madarash-Hill and Allred (2007) in their research papers entitled "Outsourcing Digital Reference: The User Perspective" argued that with the advent of digital reference, the outsourcing of a portion of public service possible, enabling libraries to offer more hours of service at a lower cost with little awareness on the part of users. A comparative analysis of digital reference transcripts and user satisfaction survey was conducted. The survey indicated that external librarians can provide with good digital reference service with a high level of user satisfaction. With its strong commitment to serve distance learners and e-learners, South Eastern Louisiana University has been aggressive in developing services to better serve a new generation of learners. Outsourcing a portion of its digital reference service had enabled the University to better meet these students' needs by allowing the library to cost-effectively offer a 24/7 service with a limited number of local reference librarians. An analysis of user satisfaction surveys and digital reference transcripts indicated that the lack of local knowledge occasionally caused some degradation of reference service by external company librarians. Nevertheless, satisfaction is still high, and outsourcing at the university had been a success.

Lankes (2008) in his article "Virtual reference services: Virtual Reference to Participatory Librarianship: Expanding the Conversation" provided information concerning the use of virtual reference services (VRS) for libraries, as well as the introduction of a series of assertions and questions acknowledging that the foundation of reference is a conversation for learning in the U.S. The author inferred that over several years an intensive effort has been underway to better understand to reinvent reference in a digital age. Even in the settings of a virtual reference cooperative that used referral systems, the fundamental content-loaded process was seen as one librarian and one patron.

Shachaf (2008) in his research paper “Virtual reference services: Implementation of Professional and Ethical Standards.” addressed that virtual reference, which allowed users to connect easily with librarians on line, was becoming popular. Librarians answered thousands of questions every day over the Internet. As the service matured, professional associations published standards that provided professional guidelines to improve the quality of the services. This study focused attention on the quality of these e- services in light of professional and ethical standards in the field. It examined the extent to which librarians adhered to professional and ethical guidelines and the role that virtual reference plays in providing services to diverse user groups. First, it discussed adherence to the professional standards and showed that the professional behaviours of librarians vary depending on the user, institution, and request types. Then, it discussed the extent to which librarians provide equitable online reference services to diverse users groups and the inconsistent findings from empirical research.

Wang, Xie and Knight (2009) in their research study “UCDRS and the Trend of Collaborated Real-Time Digital Reference Services in China” discussed the development of computer and Internet technologies that provided an alternative way for libraries to better serve their patrons. In addition to traditional reference service, online digital reference became more predominant. According to the author real-time digital reference, another form of online digital reference allows synchronous communication between patrons and librarians. This reference service was developed in China at the beginning of the 21st century. United Combined Digital Reference Service (UCDRS) was one of the most visited real-time digital reference services in China. Detailed information on the system work flow, the user, and the reference librarian experience, as well as document delivery, is discussed in this paper. The author concluded that UCDRS system of China is a firm and solid example of the trend that is becoming the norm for library reference services in China.

Cogo (2009) in his article “Libraries Demonstrate Low Adherence to Virtual Reference Service Guidelines” evaluated the level to which virtual (asynchronous i.e. e-mail) reference services adhered to professional guidelines. This study suggested that higher levels of virtual reference service effectiveness could be achieved by automatically integrating some less observed behaviour into replies sent to users and by increasing librarians’

awareness of professional guidelines through training and detailed institutional policies. The authors also suggested that librarians should be aware of their tendencies to react differently to different user groups and that administrators can facilitate this by providing diversity workshops adapted from the source document.

Dollah and Diljit (2010) in their research work entitled “Determining the Effectiveness of Digital Reference Services in Malaysian Academic Libraries” aimed to determine the effectiveness of digital reference services in academic libraries in Malaysia. They focussed on the awareness, usage, users’ perception, library’s performance, perceived needs, issues, and problems faced by students. The research methodology employed for the study was a case study approach that combined three data collection methods: questionnaires, interviews, and content analysis. This study revealed that the majority of respondents (67.30 percent) were aware of their university library offering DRS. The study also found that face-to-face consultations were used by a majority of the respondents (56.20 percent), telephone consultations (6.30 percent), and correspondence by (6.00 percent). Approximately 20 percent used e-mail reference, 28.20 percent used web forms, 26.80 percent used Ask-A-Librarian, and 4.90 percent used online chat reference. In terms of users’ perception, the study found that majority of the respondents (54.50 percent) regard the service as of somewhat high quality, 38.50 percent high quality, and 4.70 percent as very high quality. It is also found that 1.70 percent of the respondents regard the service as poor quality and 0.70 percent as very poor quality. The researchers hoped that the findings of this study would contribute positively toward the development of digital reference services, as well as other aspects of on-line services, in academic libraries in Malaysia and internationally.

Olszewski and Rumbaugh (2010) in their paper entitled “An International Comparison of Virtual Reference Services” attempted to determine and compare the nature of virtual reference services in both academic and public libraries outside the United States. They analyzed data compiled from Web form transactions e-mailed to and from libraries via the Question Point virtual reference service. The study reviewed transactions that were handled during a typical week in April 2006 and in April 2008 by twenty-three libraries in ten countries. They analyzed transactions by language, type of institution

(public or academic), question type (access, bibliographic, or subject), answer type, subject, and response time, with attention to how those characteristics had changed in two years. The findings of the study revealed that English was used by the greatest number of users, early half of all subject-related questions were about humanities subjects, while the remainder were equally split between the social sciences and sciences. In academic libraries, slightly more than one-third of all questions asked were about humanities subjects, but the sciences and social sciences were tied at second. In public libraries, however, two-thirds of all questions asked about humanities subjects. The results of the study provided insight into how students and the general public used virtual reference services in various countries and how service efficiency differed among countries and library types.

Beck (2010) in his article "The Role of Information Literacy in the Provision of Virtual Reference Services at the enquiry desk" explained Virtual Reference (VR) tools as a useful means of allowing remote interaction between librarians and library users. This paper focused on the use of synchronous VR tools and their potential for fostering information literacy. The use of chat software, co-browse, and Second Life was surveyed and follow-up interviews were undertaken. The findings revealed that chat does not have all the capabilities of more optimal tools which are better suited for developing a full complement of information literacy skills, such as co-browse, although chat can still approximate some of the collaborative facilities of co-browse, such as 'pushing' URLs to an enquirer within a chat session. Second Life (3D virtual world where users can socialize, connect and create using free voice and text chat) was perhaps more suited to supporting information literacy via dedicated classes or embedded within an educational context. Co-browse had great potential which might be harnessed more efficiently if its technical problems can be addressed. The author concluded with the discussion that all the three tools investigated have merits as ways of promoting information literacy within VR services at the enquiry desk, with chat reference service being the most popular because of its stable and user-friendly nature, and the ease with which it can be integrated with other products such as blogs, webpages and co-browse tools.

Luo (2011) in her research paper entitled "Text Reference Service: Delivery, Characteristics, and Best practices" presented a detailed depiction of the text reference

environment and its affordance, and suggested strategies to help librarians adhered to the Reference and User Services Association (RUSA) behavioural guidelines in text reference service. The author reviewed the current text reference literature as well as conducted qualitative and quantitative analysis of reference services provided by My Info Quest, the USA's first collaborative text reference service. The findings of the study revealed that two models of text reference service were uncovered: mobile device based and computer application based. The considerations for developing a service were primarily defined as relating to budget, staffing, and usability. Text reference was characterized as somewhere between synchronous and asynchronous, increasing in volume, and mostly concerned with short, straightforward questions and answers. These factors all influenced adherence to RUSA guidelines for behavioural performance of reference librarians. The study would provide ideas to help libraries effectively establish text reference service.

Nicholas (2011) in his article entitled "Creating a Digital Reference Agenda for Academic Libraries in Jamaica: An Exploratory Case Study" discussed the origin of digital reference service and how it became a ubiquitous feature of the twenty-first-century library. The study examined the service offered at the Syracuse University using case study method. The objectives of the study were to identify the various models of DRS, determined the issues that librarians need to consider when offering DRS and to analyze the students' perceptions of the service at Syracuse University. An exploratory research was done during the period October to December 2009 in which an online survey was administered to the students at the School of Information to determine their perception of the service provided by the Bird Library and its implications for libraries in Jamaica. A total of 53 respondents participated. The results showed that most respondents used the face-to-face reference service (57.00 percent), followed by (55.00 percent) who used email. Ask-A-Librarian, another online chat service used by 47.00 percent respondents and instant messaging was used by 28.00 percent. In addition to this, it was also found that 55.00 percent respondents viewed it as important or very important. There was 38.00 percent who considered it as not so important and 6.00 percent said they were not sure. A total of 51.00 percent of the respondents gave the service a high rating.

Jadhav and Kumbhar (2011) in their paper entitled “Open Source Video Conferencing Software’s: Tools for Digital Reference Services in Libraries” discussed the importance of information and communication technology and their use in the library. According to the authors, implementation of digital reference service (DRS) developed by libraries could satisfy the virtual community. In their paper, they focused on video conferencing as an important tool for digital reference in library and information centre. They highlighted DRS, with particular reference to video conferencing as one of the services which connect users at different geographical locations so they could communicate, interact and get the required information virtually. Finally, the paper explained the video conferencing solutions and open source software (OSS) tools of video conferencing, Dimdim, Ekiga, BigBlueButton, VMukti, Openmeetings etc., are applicable for digital reference. The study also explained how the time, processes and geographical limitations can be reduced through video conferencing reference service, which would otherwise have been taken very long time. The authors concluded with a perception that librarians, as well as their institutions, must be prepared to deal proactively with these technological forces reshaping the reference service environment.

Connaway and Radford (2011) in their article entitled “Seeking Synchronicity: Revelations and Recommendations for Virtual Reference”, a new membership report from OCLC Research, in partnership with Rutgers, the State University of New Jersey, Seeking Synchronicity distills more than five years of virtual reference (VR) research into a readable summary that features memorable quotes that vividly illustrate very specific and actionable suggestions. Taken from a multi-phase research project that included focus group interviews, surveys, transcript analysis, and phone interviews, with VR librarians, users, and non-users, these findings are meant to help practitioners develop and sustain VR services and systems. The report asserts that the “R” in “VR” needs to emphasize virtual “Relationships” as well as “Reference”.

Chan, Ly and Meulemans (2012) in their research paper entitled “Extending IM beyond the Reference Desk: A Case Study on the Integration of Chat Reference and Library-Wide Instant Messaging Network” explained Instant messaging (IM) as a prevalent contact point for library patrons to get information and reference help,

commonly known as chat reference or virtual reference. They argued that libraries were using many different chat-reference software packages namely, QuestionPoint, Meebo, and LibraryH3lp. Less commonly used is Openfire (www.igniterealtime.org/projects/openfire), an open-source IM network and a single unified application that uses the Extensible Messaging and Presence Protocol (XMPP), a widely adopted open protocol for IM. They defined Openfire as an open source IM network and a single unified application that meets the needs of chat reference and internal communications. This case study described the chat reference and internal communications environment at the CSUSM Library and the selection, implementation, and evaluation of Openfire. In addition, the authors discussed new features of Openfire and Fastpath for chat reference that were previously unavailable to chat reference at CSUSM. The addition of queues, message transfer, and transcripts has enhanced the effectiveness of this service and eased its management. Compared to the prior chat reference implementations that used QuestionPoint and Meebo, this new system is more user-friendly and robust the benefits of deploying an integrated instant messaging and chat reference network.

Waugh (2013) in his article entitled “Formality in Chat Reference: Perceptions of 17 to 25 Year-Old University Students” examined the ways in which the formality of language used by librarians affects 17 to 25 -year-old university students’ perceptions of synchronous virtual reference interactions (chat reference), in particular, perceptions of answer accuracy, interpersonal connection, competency, professionalism, and overall satisfaction. In this qualitative study semi-structured interview was used to examine the perceptions of participants. The analysis suggested that participants perceived the formal librarian as being “robotic” and impersonal while the informal librarian was thought to be more invested in the reference interaction. Several participants viewed the formal librarian as more competent and trustworthy and questioned the effort put forth by the informal librarian, who was perceived as young and inexperienced. Participants’ perceptions of professionalism were based on expectations of social distance and formality. Satisfaction was based on content and relational factors. Several participants preferred the formal interaction based on perceptions of competency, while others preferred the informal librarian due to perceived interpersonal connection. The author concluded by saying that formality played a key role in altering the perceptions of 17 to

25-year-olds when viewing virtual reference interaction transcripts. Both language styles had advantages and disadvantages, suggesting that librarians should become cognizant of manipulating their language to encourage user satisfaction.

Dodge (2013) in his study entitled “Hi, r u there? Adventures in Chat Reference Librarianship” discussed key issues that they see in academic library public services, to envision what they feel, librarians in public service have to offer to academia, to tell us of their visions for the profession, or to tell us about research that is going on in library schools. They hoped to provide fresh perspectives from those entering our field, in both the United States and other countries. Interested faculty of graduate library and information science programs who would like their students’ ideas represented in these pages are invited to contact Nancy H. Dewald at nxd7@psu.edu.

Chow and Croxton (2014) in their article entitled “A Usability Evaluation of Academic Virtual Reference Services” examined the usability of five virtual reference services, which includes -instant messenger, chat, e-mail, telephone, text messaging, and Skype videoconferencing- by having 31 undergraduate and graduate students to evaluate the usability of the virtual reference services of two different universities. The study’s results suggested that user preference and satisfaction for virtual reference service were highly correlated with the service’s overall usability in terms of effectiveness and efficiency. Online chat was rated highest across all measures including satisfaction and seven different usability factors. Major implications of the study suggest that online chat is the virtual reference of choice for university students and that usability metrics are a good predictor of user preferences centered on high return on investment, speed of transaction, convenience, and minimal effort.

Khan and Khan (2014) in their work “Implementation of Digital Reference Services in Pakistani Libraries: A Descriptive and Critical Annotated Bibliographical Guide” discussed the difference between traditional library reference service and digital reference service. Unlike the traditional library reference service, a digital reference service allows users to submit questions and receive answers via the Internet and other electronic methods of communication. They discussed the history of digital reference service. The authors also explained various forms and or mediums of digital reference

service. The concept and issues related to the use of digital reference in academic libraries had also been discussed. The authors explained the various other terms sometimes used for digital reference services, their history, how they work in practice, the implications for users and libraries, and speculated about the future.

Malik and Mahmood (2014) in their article entitled “Readiness for Digital Reference Service (DRS) in University Libraries: A Survey in the Punjab, Pakistan” reported a research study aimed to explore the readiness for digital reference service (DRS) of university libraries of the province of Punjab, Pakistan, in terms of organizational awareness, willingness, planning and strength of resources. In their study survey method was employed. The findings revealed that only a few libraries were at a level of DRS readiness while the others were adopting this system at a slow pace.

Yang and Dalal (2014) in their article “Delivering Virtual Reference Services on the Web: An Investigation into the Current Practice by Academic Libraries” described a study on web-based reference services in academic libraries. A random sample of 362 institutions was taken from Peterson’s Four-Year Colleges in 2013. The authors scanned each library’s website for reference-related activities, specifically if the library 1) provided or advertised reference on the main page and terminology used to advertise the reference service; 2) provided chat and related information such as chat box location, provider (in-house vs. consortia), and the vendor or program used and 3) provided other forms of virtual reference through email, phone, text messaging, instant messenger, video chat, interactive knowledge base, and other technologies. The findings indicated that approximately 68.00 percent of the libraries in the sample stated reference services on the main web page. About 74.00 percent of the libraries used at least one of the following technologies for virtual reference: email, phone, chat, IM, text, and video chat. Exactly 47.50 percent of the libraries provide chat-based reference service. The institutions that offer more advanced degrees and have more students are more likely to offer chat based reference service than those who offer low-level degrees and fewer students. This is the only study on a large scale with details about the virtual reference in academic libraries.

Musangi (2015) in his paper “Redefining Reference Services in Academic Libraries: A Critical Review”

argued that within the 21st century, academic libraries have witnessed a lot of technological changes, which could not be wished away. According to the author considering the kind of users, librarians should rethink and examine the reference service environment in a more theoretical and conceptual ways. The study threw light on various reference models which include traditional reference service model, tiered service model as well new reference service models. In this paper, the author reviewed how emerging technologies are being utilized to offer virtual reference services and how they have impacted on academic libraries. The author discussed how Web 2.0 tools could be applied in reference services where library clients may seek 24/7 help from the reference librarian. He argued that Libraries may prefer using free chat software such as Yahoo! Messenger, Google Talk, AOL Instant Messenger, Meebo, LiveZilla and much more. The majority of academic libraries in Kenya analyzed, are using one or more DRS tools. However, DRS should not be taken as a total replacement of the face-to-face reference service.

Roy and Bhattacharya (2015) in their research paper entitled “The Future of Reference Service: Treading Into and Going Beyond Digital Reference Service” threw light on the present bandwagon of digital reference service with a glimpse into the background and genesis of traditional reference service. They argued that existing reference services include asynchronous transactions like e-mail, web forms, Ask-A type services and synchronous transactions like live chatting, video conferencing etc. They further elaborated the fact of the changing methods of DRS where as the purpose of DRS remained and would be unchanged. According to the authors, digital reference process marked a line of demarcation for itself from the traditional one. They also discussed some technological innovations like mobile apps, social networking, Live Chat with the online readers etc. which could rightly be said as the future of digital reference service which seems to be very beneficial for the people with special needs also.

Khobragade and Lihitkar (2016) in their article “Evaluation of Virtual Reference Service Provided by IIT Libraries: A Survey” highlighted on virtual reference service (VRS) in academic libraries. The authors threw light on the benefits, elements and modes of VRS. They also tried to find out the status of VRS being offered by conducting users study in the IIT libraries in India. An investigation

and survey method was employed for the study. It was observed from the study, that 86.04 percent users were accessing the internet for their education purpose that includes academic activities, career development, and limited high-quality self-discovery activities. Most of the library users agreed that computer literacy is importance whenever using e-resources, about their institution’s library websites, as well as, about their institution’s library offering VRS. Most of the IIT libraries’ users rated that it is easy to use the VRS. About 35 percent users ‘Agreed’ and 26.27 percent ‘Somewhat agree’ that libraries offer sufficient information literacy skills programme. About 38.00 percent users were satisfied and 29.19 percent users very satisfied with VRS provided by the library, 24.08 percent users ‘somewhat satisfied’ and 8.75 percent were unsatisfied. The authors concluded with reference service initiated electronically often in real-time, where patrons employ computers or other internet technology to communicate with reference staff, without being physically present. VRSs are increasingly incorporating instruction because of the growing need to teach patrons how to use the exploding electronic resources in libraries. Virtual reference is here to stay. As new technologies are developed the ways in which virtual reference is provided will continue to evolve. This study is an important first step towards better understanding how virtual library services can be successfully integrated into existing library and information services.

Inferences drawn from the Review of Literature

The inference drawn on the basis of literature review done so far reveals that several research papers are based on the implementation of Virtual Reference Service which includes staffing, software, training of staff, marketing and evaluation.

Other aspects like usage analysis and user analysis have also been discussed by many authors. It has also been observed that a good number of papers are focussed on theoretical and conceptual aspects of VRS.

Some authors have discussed Digital Reference Service Model.

As per the literature, authors have also explored the possibility of collaborative VRS.

In several papers, the researchers have articulated standards and quality assessment. Many authors have also highlighted on aspects like utility and application of VRS.

Some studies have discussed outsourcing of VRS by the libraries whereas a few have described the implementation of VRS using Open Source Softwares (FOSS) like RAKIM, Openfire, etc.

Some authors argued that pace of adoption of VRS is slow. Few of the studies dealt with case studies where as other few studies adopted survey of reference librarians as well as VRS users.

The studies also discussed on problems and issues related to the implementation of VRS in libraries. A few articles are focused on VRS readiness.

Conclusion

Virtual reference service or digital reference service brings E-governance in libraries through accessible, convenient, reliable, trust worthy and user-friendly online Point-of-Service (POS) available 24/7. It creates a bonding between library and user community as they get solutions to the problems they face in addition to several information services built upon VRS model. A literature review in the area provides a deeper insight and enhances the understanding of the field of study. It highlights the trends and initiatives taken by libraries world-over in the direction of VRS adoption and implementation. The review reveals that the service has got obtained wider acceptance and has been able to bridge the gap between information need and information acquisition. VRS can go a long way in the image building of the libraries by serving their user community in a better way, and that too in real time.

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