
UNIT 11 REFERENCE SERVICES

Structure

- 11.0 Objectives
 - 11.1 Introduction
 - 11.2 Reference Service
 - 11.3 Need for Reference Service
 - 11.4 Reference Service Process
 - 11.4.1 Query Analysis
 - 11.4.2 Reference Interview
 - 11.4.3 Refining User Statement
 - 11.4.4 Formulation of Search Strategy
 - 11.4.5 Searching
 - 11.4.6 Notification to the User
 - 11.4.7 Feedback Analysis and Evaluation
 - 11.4.8 Unanswered Questions
 - 11.5 Digital Reference Service
 - 11.5.1 E-mail Reference Service
 - 11.5.2 Real Time Digital Reference Service
 - 11.6 Evaluation of Digital Reference Service
 - 11.7 Major Digital Reference Services Projects
 - 11.7.1 Collaborative Digital Reference Service
 - 11.7.2 Automatic Reference Librarians for the World Wide Web
 - 11.7.3 Virtual Reference Desk (VRD)
 - 11.7.4 24/7 Reference
 - 11.8 Expert Systems in Reference Service
 - 11.9 Future of Reference Service
 - 11.10 Summary
 - 11.11 Answers to Self Check Exercises
 - 11.12 Keywords
 - 11.13 References and Further Reading
- Appendix

11.0 OBJECTIVES

In the Units 8, 9 and 10 of this course you have been told about the services offered by libraries and information centres. In this Unit, you will come to know some of the basic aspects as well as information technology-based reference services provided by the libraries and information centres to their users:

After reading this Unit you will be able to:

- understand the basics of reference service;
- identify the purpose of reference service;

- know the step-by-step process for handling a reference query;
- know the method of conducting reference interview;
- understand various kinds of reference enquiries made by the users and modes of receipt and delivery of information;
- know about the possible applications of expert systems in answering reference queries;
- know how to provide reference service in digital environment;
- study the various kinds of digital reference services, i.e., e-mail reference service, real time reference service, offered by the libraries in western countries;
- study the examples of Virtual Reference Desk, 24/7 Reference and Collaborative Digital Reference Service provided by the Library of Congress and by some other libraries in UK and USA ; and
- know the parameters on the basis of which digital reference service can be evaluated.

11.1 INTRODUCTION

Libraries and information centres offer a variety of information services to their clientele to meet their information requirements. These services may be anticipatory and of responsive type. Anticipatory information services are provided by the initiatives of the library staff whereas responsive information services are provided against the requests made by the users. The first type of requirement is normally met from the in-house collection of documents. Some times users are directed to the source of information or they are just guided by the library staff to find out what is where. The basic objective of library is to save the time of the user and to provide right information as quickly as possible. Towards this objective, libraries and information centres need to plan the collection development appropriately, and use appropriate tools and techniques for quickly locating and retrieving and transmitting information to the users.

Handling reference queries is a professional and skilled job. It requires proper understanding of subject, analytical approach, knowledge of relevant technologies for collection and dissemination of resources. The complete reference process including conducting of reference interview, analysing the query, and searching and providing relevant information to the satisfaction of the users, all have been discussed in this Unit. Major digital reference services, and technologies used for providing these services have also been discussed with examples. Providing reference services in digital environment has also been discussed.

11.2 REFERENCE SERVICE

According to Dr. SR Ranganathan, “reference service is a personal service to each reader in helping him to find the documents answering his interest at the moment pinpointedly, exhaustively and expeditiously”. In his view, providing reference service means making contact between the right user and the right book at the right time and in the right personal way.

CA Bunge says, “Reference service, some times referred to as reference and information service, which refers to the personal assistance provided to the information seekers in the pursuit of information”. Further, he categorised the reference service in the following three broader categories:

- That which involves either finding the required information on behalf of the information seekers or assisting them in searching information.
- That which develops information seeking skills in the users.
- That which guides information seekers in selecting most relevant appropriate information sources and services.

According to DJ Foskett, “Reference service is currently humanism in practice because the aim is to help people, in a way or other, to secure great happiness through the possession of knowledge”.

Margaret Hutchins equated the term reference service with reference work. She says, “reference service includes direct personal aid, within a library, to persons in search of information whatever purpose, and also various library activities especially aimed at making information as easily available as possible”.

In the present electronic and communication environment reference service is not only confined to the library users but also to remote users. Some times, it is termed as electronic reference (e-reference) service, digital reference (d-reference) service, virtual reference (v-reference) service, etc. Whatsoever may be the nomenclature, its basic function is to provide point-of-need reference service to information seekers at the place where they are and when they have a query.

11.3 NEED FOR REFERENCE SERVICE

Information is recorded in a variety of documents like books, reports, periodicals, digests, theses, standards, patents and so on. A reader may need a specific type of information for a specific purpose. The number of documents produced is very large, so large that it is impossible for the reader to keep track of its variety and location. Users, often spend much time in locating information required by them. After making a lot of efforts, users some times fail to retrieve required information due to not following the proper search strategy or not having the subject knowledge in the field. Reference librarians are also finding it a daunting task to keep abreast of the new resources that appear daily on various types of recordable media. Here, the reference librarian’s main functions are: (1) to keep track of the outpouring of documents in the subjects of the clientele, which his library hopes to serve and (2) to study as closely as possible the information needs of the clientele. He needs to provide instructions, both individual or in groups with the aim of helping the users to become more self-reliant in accessing information sources, to suit the Chinese proverb ‘*give a man a fish, he will eat for a day, teach a man to fish, he will eat through out his life*’. Thus, one can summarise the need and purpose of the reference service as follows:

- To satisfy the information requirements of the users and demand for intensive services.
- To be in pace with modern tools and techniques developed for providing information services to the information seekers.
- To know the availability and location of required documents in print and non-print formats.
- To evaluate multidimensional growth of libraries and their complexities.

Now, there is an increasing trend towards replacement of human-delivered reference service by the machine-assisted reference service to make it available to remote users. These will be discussed in the later parts of this Unit.

Self Check Exercise

- 1) Explain in simple terms what do you understand by the term 'Reference Service' and how it is needed in a library and information centre?

- Note :** i) Write your answer in the space given below.
ii) Check your answer with the answers given at the end of the Unit.

.....

.....

.....

.....

.....

.....

.....

11.4 REFERENCE SERVICE PROCESS

For providing efficient reference service, the reference librarian needs to adopt a systematic approach. This approach involves interaction with the user, understanding of the query and adequate knowledge of reference sources. Sometimes, a very simple question asked by the user becomes unnecessarily complicated due to many reasons—lack of knowledge of reference librarian, communication gap between the reference librarian and the user, for instance, the question was not properly stated by the user or understood by the reference librarian and so on. Therefore, the reference needs to avoid such a situation by getting necessary clarification before the search is started. After proper understanding of question, the reference librarian begins his search from in-house sources, then if the information available is not adequate, searches external sources and finally collects the required information wherever available. During the search process or at the end of the search, the reference librarian should establish dialogue for seeking more clarifications about the relevance of the search results to the user's query. In case the user cannot provide background information on the subject, the reference librarian may consult encyclopedias, handbooks, text-books, Internet sources or any other relevant source. The complete reference process, i.e., from the receipt of an information request till the required information is communicated to the user, can be broken down into a series of decision-making steps. These steps are briefly discussed below:

11.4.1 Query Analysis

When the reference librarian receives a request or query for information, he/she must understand the query in as much depth as is necessary or possible. If subject of the query is not familiar, the reference librarian must get an idea on it by consulting dictionaries, encyclopaedias, handbooks or textbooks. Then he must analyse the query as deep as possible, and prepare a rough search strategy.

11.4.2 Reference Interview

After getting a basic idea of the subject of the query or an understanding of the query (or request), the reference library must make efforts to have a personal interaction with the information seeker or the user to get a precise understanding of the query. He must ask all the questions necessary to get a clear understanding of the query. The questions put to the user must be open-ended, as they allow the user to take off and start talking on the other hand, closed questions limit possible responses to 'yes' or 'no' type answers.

Such an understanding obtained through the interview helps the librarian to formulate his/her search strategy in specific and clear terms and in quickly tapping the right information.

However, if the request for information is from a senior level official or executive, the librarian may not be able to get the opportunity for the interview. In such cases, the librarian must get above information about the subject specialisation of the user or if he is a top official, the context of the information requirement and this information will help in providing the required information with some (acceptable) relevance.

Even if the reference librarian is able to get the reference interview, before conducting the search, he may often need to seek further clarifications during the course of the search to improve the relevance of the information he supplies. To minimize the efforts of seeking clarifications again and again, the reference librarian must design Information Search Request forms and gets it filled up by the requester before conducting the reference interview. A sample Information Search form is given at Appendix-A.

11.4.3 Refining User Statement

Once the reference interview process is over, the next step is to refine the statement of user and transform the user's query into the searchable statement. It involves selection of appropriate terms to be used for searching. Reference librarian may also consult controlled vocabularies, i.e., thesauri, subject heading lists, classification schedules, etc. in this regard.

11.4.4 Formulation of Search Strategy

Formulation of search strategy is a plan for hitting on the right information that answers the user's query. Generally, reference librarian tends to jump immediately into an unfocused search using 'piece meal' or 'hit and miss search' without analysing the search request and formulating systematic search strategy. It is good to spend some time at the beginning of a search in organising and formulating a proper search strategy for a much more productive and efficient search. Such a strategy would involve identifying potential sources, selection among these sources, searching within the sources chosen, etc. He should systematically comb the sources to dig out information. There are a number of steps involved in this process from selection of relevant source or databases, selection of appropriate web sites on Internet, standardizing and grouping of selected terms, combining them using Boolean operators AND, OR, NOT to make a final search statement for searching.

11.4.5 Searching

A quotation from Alice in the Wonder Land:

'If you do not know where you are going, then it does not matter where you end up. If you do not know where you want to go, you probably would not get there. If you do not know where you are going, any road will take you there.'

It means the reference librarian must be precisely clear on what he is going to search; otherwise, he may end up with some other result or irrelevant information. There are different types of searching mechanism —exhaustive, precision, pearl growing, snowball, and situational. The reference librarian can use one or combination of more than one mechanism to formulate search strategy. In an exhaustive type search, efforts can be made to focus on collection of all possible information, which may be of peripheral interest to the user. The 'precision' search is focused to identify the targeted information, which is directly relevant to the user's need. Using the 'pearl growing' technique, the reference librarian starts search from the point where he knows a little on the topic. He begins his search using whatever facts are available and then refines the search strategy step by step. In case the reference librarian is new to the topic being searched, he may consult an expert in the field before search process is started. This type of search is called 'snowball' search. The process of searching may be changed with the change of situation during the course of searching. It depends upon the changing needs of the user, interpretation given by the user during the reference interview, availability and accessibility of resources, permissible time for searching, cost involved and many other factors. This type of search

is called 'situational' search. The reference librarian should also make record of information sources consulted or to be consulted. The record should be very clear and systematic enough to allow someone else to continue the work in the absence of the person who received the question.

If the request can not be fulfilled by the sources available in the library, the reference librarian should not give it up because the world of information do not start and end at his library. He may be able to help the user by drawing the resources of other libraries through data transmission networks. Advantage of information and communication technology, like telephone, e-mail, fax, Internet, etc. may also be taken for the purpose.

11.4.6 Notification to the User

After search process is over, the reference librarian should inform the user and disseminate information in appropriate form as quickly as possible as speed of supply is critically important. Also, the result of the search should be appropriately formatted because presentation and delivery of the result reflects the efficiency and involvement of reference librarian in answering the query. It may be given in printed, audio-visual or any other form acceptable to the user. Supplied information must fulfill the requirements of the user. It must have relevance for him.

11.4.7 Feedback Analysis and Evaluation

No improvement can be made in any system, including reference service, unless it is properly evaluated.

A main component of such evaluation is obtaining feedback from the user on the relevance of the information provided. The reference librarian should therefore seek invariably feedback on the relevance of the information supplied and try to improve the service for further requests so that he can satisfy the users better. It is important to design a feedback mechanism, say, using a performa, and seek feedback against every supply of information. The search methodology or process is to be improved continually based on such feedback. Other components of the evaluation are the speed of supply, the courtesy extended, initiative taken to continue to supply information like the requirement is met, and so on. He should make sure that information provided to the user has been well accepted by him. He should politely ask the user to provide feedback about the relevance of the information, satisfactory level of the service rendered to him, etc. User may make certain comments/suggestions, which may be taken in a positive way for the improvement of the reference service.

11.4.8 Unanswered Questions

No system can be perfect and much less so is the reference service system. As long as reference service is done by humans, errors or deficiencies are bound to occur. However, the reference librarian should always endeavour to create an effective and efficient system. The reference librarian may not be able to provide answers of all questions asked by the user. He might have overlooked the answer in the available sources; the answer might not be available in the in—house collection; or the question might not have definite meaning and answer. If the unanswerable questions of a similar type seem to be recurring, the reference librarian should try to fill the gap in the reference collection through the acquisition group. If the desired information cannot be located from in-house collection, the same may be tried through cooperative or networking arrangement. There are other agencies which have specialisation in certain types of reference services and products, e.g., Ask A Librarian, Ask A Scientist, Ask A Teacher, 24/7 Reference, etc. These agencies may be contacted for such type of questions. The user should not be left with negative response even the question is not answered. He may be suggested the places where he can go and find answer. Even making a telephone call, if necessary, to fix an appointment with another information provider may help to increase satisfaction level of the users. Providing reference service is a complex and multi-process activity therefore, errors are bound to occur. Focus should be on the elimination of errors and to improve the efficiency and quality of reference service.

2) Explain the various steps in the ‘Reference Service Process’.

- Note :** i) Write your answer in the space given below.
 ii) Check your answer with the answers given at the end of the Unit.

.....

.....

.....

.....

.....

.....

11.5 DIGITAL REFERENCE SERVICE

In this fast changing technology era, researchers need to find relevant, usable, authentic and verifiable information as quickly as possible. To meet this requirement, libraries and information centres need to augment their conventional reference service using ICT. Using these technologies, libraries maintain digital collections and also access digital or electronic information sources and provide information in digital/ electronic mode. With the emergence of digital libraries and Internet, the concept of traditional reference service has changed. Even many non-library commercial organisations now offering digital reference service to their clientele. While some are free, others need payment. In digital reference service, the web is used as a medium of communication for sending the questions and receiving answers, which is quite useful in providing fast answers to the questions. However, the reference librarian needs different skills for accessing digital information sources and communicating the information to the users.

In the process of providing digital reference service, the reference librarian receives questions via e-mail or web interface, identifies the query and then decides appropriate course of action. He analyses the request and gets the type of information required. The question may also be checked with the archive file, which is usually called Frequently Asked Questions (FAQ) File. The answer may be supplied to him through appropriate mode of communication. Based on the mode of receiving question and delivering information, the digital reference service can be broadly categorized into two groups:

- 1) E-Mail Reference Service.
- 2) Real Time Digital Reference Service.

11.5.1 E-Mail Reference Service

The e-Mail reference transaction involves back-and-forth exchange of information, users would not get any immediate answer. But users can ask a question when they think of it, at any time of the day or night. And they do not have to take time to make a special trip to the library. In other words, the users send e-mail to the library with a reference question, asking whatever information they feel necessary. The library sends reply by e-mail, fax, phone or letter as it finds convenient. In such a case, the controller of all questions initially receives and examines and then routes them to appropriate staff. Technical questions are forwarded to technical staff, circulation related questions to the circulation staff, reference questions to the reference librarian, and so on.

Initially, this service was adapted by the health and engineering libraries, now it has established itself as a basic service in majority of libraries having Internet connectivity. This service has certain advantages to the users:

- Who feel shy and uneasy about asking questions in person, face-to-face or by telephone.
- Who are poor in oral communication.
- Who may not be able to visit library due to certain difficulties in physical movement, living at a long distance from the library, and so on.

Besides above advantages, there are certain disadvantages also:

- Reference librarian cannot establish eye contact or conduct face-to-face reference interview to seek any clarification with the user.
- It is difficult to judge the urgency of the requirement of information.
- To know the degree of the user's satisfaction for further modification of search strategy for providing more relevant answer.
- Speed of asking a question and getting an answer depends upon the volume of e-mail traffic and communication link over the Internet.
- Reference librarian needs to make more efforts in understanding the meaning of the asked question. Sometimes, he misses the focus of the asked question because users often do not clearly express the question.

E-mail reference service also offers the following advantages for the reference librarian as well:

- Reference librarian finds more time to think, plan, chalk out search strategy and finally search the answer.
- Simple or easy questions can also be answered by other staff.
- Reference librarian can devote more time on questions of complex nature. This way the workload of reference process can be distributed among other staff.
- Question can also be diverted to the experts, if required.
- There is no restriction on working time. Question can be answered any time after working hours.
- This mode of receiving and answering questions is very cost-effective.

Library can design a user-friendly request form, which can be filled up by the users through downloading from the library's web site. A sample Digital Reference Service - Request Form is given at *Appendix 'B'*. The user can send a completed request form to the library by clicking a button on the web labeled 'submit' or 'send'. A well-designed Request Form will eliminate problems and provide right framework for finding out what the user really wants to know. There should be a standard format for the Request Form for all types of questions. The Request Form should bear essential instructions and advice about how to complete it. It should be as short as possible so that it takes a little time to complete. Library can reply users by e-mail or in any other appropriate form, acceptable to the users.

The following table gives a quick overview of some of the prominent e-mail reference services currently in operation:

Service	Subject	Payment	Organisation	Remarks
Askme	All	Free	Askme.com	
AllExperts	All	Free	Allexperts.com	
Inforocket	All	Fee-based	Inforocket.com	(Charges from \$5 to \$75)
AskAuntieNolo	Law	Free	Nolo.com	
Find/svp	Business	Fee-based	Findsvp.com	(Charges \$250 per question)
Professional City	Law	Fee-based	Professionalcity.com	(Charges \$25 per question for first 15 minutes and \$18.75 per additional 15 min)

Information is searched by experts and delivered to the users via e-mail. Besides the above, there are other services available where users need to conduct a search for a reference query. Some of them are:

Internet Public Library	(http://www.ilp.org)
Infoplease	(http://www.infoplease.com)
Britannica	(http://www.britannica.com)
Bartleby Reference	(http://www.bartleby.com/reference/)
Internet Library for Librarians	(http://www.itcompany.com/inforetriever/)
Electric Library	(http://www.ask.elibrary.com/refdesk.asp)
Mediaeater Reference Desk	(http://www.mediaeater.com/easy-access/ref.html)
Reference Desk	(http://www.referencedesk.org)
Xrefer	(http://www.xrefer.com)

Although these services are available free of charge but some charge nominal fee. For example, Electric Library charges US\$ 80 as annual charge for unlimited access.

11.5.2 Real Time Digital Reference Service

In real time digital reference service, the exchange of information is live (it takes place in real time) between user and reference librarian. This service is still on experimental stage in developing countries because it requires advanced computer technology, faster and better communication connectivity, interactive audio and video capacity and availability of computers at home and work place. This service is not a replacement of conventional or e-mail reference service but a supplement to these services. This service is gaining popularity due to many advantages over the other two services. These include the following:

- This is a synchronous service in which reference librarian responds immediately in real time.
- Reference interview is conducted at a faster pace than e-mail.
- Clarification can be sought online.

- Reference librarian can demonstrate to the user about how to use reference sources, web sites, expert or whom the user should contact. This allows user to walk through the reference source to find answer. In addition to this, Voice Over Internet Protocol (VOIP) allows reference librarian to talk to users and hear them while connected and while locating the sources.
- This service can be offered at any time, any day (24/7 basis).
- Reference librarian can chat with several persons simultaneously.

Against the above advantages, there are several disadvantages also as compared to e-mail reference service.

- The technology is still at premature stage.
- It is a labour-intensive service.
- It makes reference librarian busy in answering the questions because it involves several back-and-forth message transactions. He may not find time to answer the urgently needed questions.
- It is stressful for reference librarian as well as user because one is waiting for other's message.
- For every inquiry, user needs to type questions every time and reference librarian also need to answer in typed form.
- Typing speed and errors occurring during typing in the text cause, both reference librarian and user, difficulties in communicating their messages because real time chatting demands fast and accurate typing speed.

In case the question is found complex in nature and requires more time for searching, the user should be requested to fill the proper form or visit the reference desk.

Real time digital reference service can be provided using chat software, live interactive communication utilities, call centre management software, interactive customer assistance system, bulletin board services software, customer interaction management software, web contact centre software and other Internet technologies. The following are some of the commonly available real time digital reference technologies and these have been used in academic and research libraries in the western countries.

Real Time Digital Reference Technologies:

- 24/7 Reference
- Anexa.com
- AOL Instant Messenger
- ConferenceRoom
- Desktop Streaming
- DigiChat
- eGain Live
- e-Gain Voice
- Group Board
- HumanClick
- LiveAssistance
- Livehelper
- LivePerson
- NetMeeting

- Netscape IRC
- OnDemand
- QuestionPoint
- Rakim
- RightNow Live
- Virtual Reference Software
- Virtual Reference Librarian
- Web Line

Examples of Real Time Digital Reference Services:

The following are some of the frequently used real time digital reference services available for providing reference services:

- Ask A Question
- Ask Now!
- Ask The Librarian
- Ask Us Now
- Ask-A-Librarian
- Chat Reference Assistance
- Chat With A Librarian
- Chat With Us
- Click For Live Help
- E-gateway
- Infochat
- Librarians Online
- Library Chat
- Live Assistance
- Live Library Reference
- Live Online Assistance
- Live Online Reference
- Live Reference Help
- Livehelp
- Need Help?Ask A Librarian
- Questions?
- Real Time Help
- Real Time Reference
- Real Time Reference Help
- Refchat
- RefDesk Live
- Reference Chat
- Reference Librarian Online
- Request It Online
- Talk To A Librarian
- Virtual Reference Desk

11.6 EVALUATION OF DIGITAL REFERENCE SERVICE

Assessing the quality means judging the quality standard of services that should be provided to the users and how quickly and accurately. The degree of quality varies from library to library because it depends upon a number of internal and external factors directly affecting the library services.

Lankes has laid down the following measures/components for assessing the quality of digital reference services rendered by any library or information centre or organisation.

- **Outcome Measures (Quality of Answers):** Accuracy of response, appropriateness to user audience, opportunities for interactivity, instructiveness, and impacts resulting from the digital reference process.
- **Process Measures (Effectiveness and Efficiency of Process):** Service accessibility, timeliness of response, clarity of service procedures, service extensiveness (percentage of questions answered), staff training and review, service review and evaluation, privacy of user information, user awareness (publicity).
- **Economic Measures (Costing and Cost-effectiveness):** Cost to conduct a digital reference session, infrastructure needed to support quality digital reference service, and impact of these costs on other library expenditures.
- **User Satisfaction (Degree of Satisfaction):** Satisfaction indicators, i.e., accuracy, behaviour of staff, facilities, etc.

Self Check Exercise

- 3) What is a digital reference service? Explain e-mail reference service and real time reference service with examples. What are various measures/components for evaluation of a digital reference service?

Note : i) Write your answer in the space given below.

- ii) Check your answer with the answers given at the end of the Unit.

.....

.....

.....

.....

.....

.....

11.7 MAJOR DIGITAL REFERENCE SERVICES PROJECTS

Brief information about some of the prominent digital reference services projects being undertaken for providing reference services is presented in the following sections:

11.7.1 Collaborative Digital Reference Service (CDRS)

The Library of Congress launched the Collaborative Digital Reference Service in June 2000. At present, more than 100 libraries from various countries are participating in this collaborative venture. Some of the major libraries are Library of Congress, National Library

of Australia, National Agricultural Library, National Library of Canada, Cornell University Library, University of Texas Library at Austin, University of Washington, University of Southern California, Metropolitan Cooperative Library System at Los Angeles, etc. The mission of this project is to provide professional reference service to the users at any time and any where through an international digital network of libraries and information centres. It is a library to library network for asking and answering reference questions. It is an international web-based cooperative network of librarians and experts in various disciplines. It is a worldwide network of libraries in which OCLC builds and maintains a database of profiles of participating institutions, maintains a question - and-answer database system that enables participants to catalogue answers and store them in a searchable/browsable database and provides help in marketing, registration, training and user support.

There are three main components of CDRS:

- 1) *Members Profiles (MP)*, which contain information on strengths and features of the members. It include addresses (including e-mail), hours of services, collection strengths, staff strengths, what is out of scope, geographical locations of the users served, any special service, average number of questions received, etc.
- 2) *Request Manager (RM)*, software for entering, routing and answering reference questions. It receives, sorts out routes and tracks down the incoming questions and delivers the credible answers to the end user.
- 3) *Knowledge Base (KB)*, a searchable database for questions and answers sets. It is an archive of questions and answers for future use.

An end user can request information through CDRS member-library and then the member-library sends question to the Reference Manager software for processing and routing. The Reference Manager will then search the database of CDRS member-libraries profiles looking for the member-libraries best suited to answer the question. The matches will be made on the basis of data elements as hours of service, including time zones, subject strengths, scope of collections, type of patron served, etc. The matching process will end within a fraction of second. Once the match on a member-library has been made, the question will be sent to that library for answering. Once the question has been answered, it is routed back to original CDRS requesting library via Reference Manager to allow for closing out the case and completing other administrative jobs. The response is sent to the requesting library by e-mail. Simultaneously, the question and answer are stored in the Knowledge Base. The strength of the reference service lies in the strength of the member libraries, RM and KB.

Currently, this is a free service and it delivers reference assistance to researchers any time and any place. It supports reference efforts by combining the power of resources and manpower with the diversity and availability of libraries and librarians everywhere. Using advanced technology that directs questions to the appropriate library based on the subject profiles, this digital network pools librarians' expertise to bring quality and professionalism in on-line reference service. The following are some of the advantages of this service:

- One library is linked to the other libraries for subjects, languages and collections outside its scope and coverage.
- Experienced reference librarians are always available to provide access to collections and resources available in more than hundred libraries and information centres worldwide.
- Librarians and information scientists can add value to reference interactions by obtaining answers to difficult questions from expert librarians at other institutions and organisations.
- Librarian can improve his library's ability to respond more quickly and accurately on a broader spectrum of research.

- Reference service is available beyond normal working hours of the library, i.e., 24 hours a day and 7 days a week.
- Reference transactions are stored in a question-answer knowledge database that can be accessed for ready reference.
- Reference questions can be answered from books, monographs, journals, magazines, citations from online catalogues and licensed databases and references to web sites. The requesting library is notified by e-mail to retrieve the answer from the server.
- This service provides opportunity to highlight the strength of the collections of participating libraries.
- Virtually, an information seeker can access not only his library where he is a bonafide member but also a union of libraries, which has many, times bigger collection than his library.

11.7.2 Automatic Reference Librarians for the World Wide Web

This project was sponsored by the University of Washington to create software agents that possess reference intelligence – a limited understanding of complex technical topics, but a very sophisticated understanding of how and where to find high quality information on the World Wide Web. It works on the basis of wrapper technology. Wrapper technology is a data that precedes or frames the main data or a program that sets up another program so that it can run successfully. This service involves the following steps:

- The user asks a question.
- The Query Router assigns a topic to the query.
- The topic maps to a number of relevant wrappers.
- The parallel web search module sends request via wrappers to the sites.
- Responses from the sites are obtained and sent to the fusion engine for collation.
- User gets the response.

It explores web directories such as YAHOO to find out searchable sites. It queries each searchable site and obtains responses from them. The responses and other information about a given site are used to assign topics to that site. Thus, each searchable site gets a wrapper containing some assigned topics, which are used for matching the topics of the users queries.

11.7.3 Virtual Reference Desk (VRD)

This project is sponsored by the US Department of Education. It is dedicated to the advancement of digital reference and the successful creation and operation of human-mediated, Internet-based information service. The VRD project organizes and provides conferences on digital reference issues for information professionals in libraries and other contexts. The VRD does not actually answer questions, but provides resources and links to experts that offer these services. The basic idea of VRD is that when a user asks a question and that can not be answered by a participating library then it is forwarded to the VRD network for assistance. This service includes:

- *Collaborative Ask A Service:* A network of Ask A Services and volunteer information professionals that ensure users' questions are addressed by the most appropriate experts.
- *The Learning Centre:* A web site for the K-12 community with curriculum-related websites, frequently asked questions, and other previously asked questions.
- *Ask A+ Locator:* A searchable database of high quality K-12 Ask A Services.

The following are some of the Ask A Services, which are Internet based question and answer services that connect users with experts and subject expertise.

- Ask a Hydrologist
- Ask a Linguist
- Ask a Parenting Expert
- Ask a Question
- Ask a Reporter
- Ask a Scientist
- Ask an Archaeologist
- Ask Dr Math
- Ask Mr Calculus
- Ask the Dentist
- Ask the Space Scientist

11.7.4 24/7 Reference

A pilot network established in the California, Los Angeles and Orange County areas to provide real time reference services directly to the library patrons over the Internet. To avail this service a librarian needs a computer with Windows 98, NT or 2000 and a direct Internet connection. This service can be used to:

- Guide the user's browser to the best resources on the Internet with collaborative browsing.
- Communicate with users real time chat.
- Send files, images, power point presentations, etc. to the patron's computer.
- Conduct meetings with up to 20 participants, while sharing web pages.
- Network with others by transferring complex questions to a local or remote expert.
- Access reports, transcripts of sessions with users, and a wide variety of usage statistics on demand.
- Customise the software to integrate with user's website.

Besides the above, there are other projects like, AskERIC, the Internet Public Library, the MAD Scientist Network, etc., which are also in operation.

Self Check Exercise

- 4) What are the major digital reference service projects in operation? Explain their functions.

Note : i) Write your answer in the space given below.

- ii) Check your answer with the answers given at the end of the Unit.

.....

.....

.....

.....

.....

.....

11.8 EXPERT SYSTEMS IN REFERENCE SERVICE

The most promising artificial intelligence technology for libraries and information centres is an expert system. An expert system is a knowledge-based computerized system, which plays a role of intelligent interface for providing access to databases and to obtain relevant information. An expert system contains knowledge about a specialized area, which enables the specialist to formulate search profiles and obtain relevant solutions for various problems. The key feature of an expert system is that it involves modeling the thought processes of human experts who are familiar with the domain of a given problem.

Expert System Design

In reference service it has been observed that a large number of reference queries repeat themselves. Majority of the questions are of ready reference types and these can be answered by directing the user or through available reference sources. User may ask location of source, contact person for a particular type of service, procedure for borrowing and lending of documents, filling up of photocopying requisition form or interlibrary loan request form, etc. Providing reference service is an area, which can largely be benefited by introducing an expert system because it functions like a human expert and it does the same thing what a human expert is supposed to do. It performs question-negotiation process with the user and provides solution by analysing the question, identifying the sources that are likely to answer the question.

While designing models of such system, at the broadest level, focus or emphasis is given to four main components: actors, objects, actions, and relationship.

- **Actors:** Actors are entities that act. Actors are most often people, but in the context of a model, a machine could also be an actor. An information seeker, a computer are all categories of actors. An on-line searcher who sends messages is also an actor.
- **Objects:** Objects are things, which are acted upon. Information-seeking models include a variety of different types of objects. Best examples of objects are information sources - the most common types of objects. There are other types of objects - a reference book, an index in a reference book, a database of reference books, a query, a record in a database, a field in a record, etc.
- **Actions:** Models of reference and search processes often describe actions. To raise a query, recommend, reformulate, look up, explain, evaluate, all are action words that appear frequently in search models. The reference process is often described in terms of the actions that are performed by the reference librarian and the user.
- **Relationships:** Finally, information seeking models are concerned with relationships. A correlation is made among the actors, objects, and actions to get the desired output in an expert system.

Advantages of Using Expert System

Applying an expert system for providing reference service has a number of advantages. These include the following:

- An expert system can be designed to store complete library collections and their locations, which may be difficult for any reference librarian to remember and locate physically.
- A multi-user expert system can serve more users at a time.
- Expert system can work round the clock even when library is closed or reference librarian is on leave.

- Interactive expert system can be used by the user more frequently than to a reference librarian.
- User may ask questions from a long distance rather than approaching to reference desk.
- Expert system in one library can be linked with other libraries which may create a network of libraries thus providing much scope of availability of source to answer the question.

Self Check Exercise

- 5) Explain an expert system, and how an expert system is useful in handling reference queries in a library and information centre?

Note : i) Write your answer in the space given below.

- ii) Check your answer with the answers given at the end of the Unit.

.....

.....

.....

.....

.....

.....

11.9 FUTURE OF REFERENCE SERVICE

It may be very difficult to make certain predictions about the future of reference services. Earlier, the mode of providing reference service was quite different from what libraries and information centres are providing after the advent of Internet. Electronic databases, and particularly on-line databases have replaced printed reference works. A good number of reference sources, i.e., encyclopedias, dictionaries, thesauri, handbooks, directories, etc are available on Internet. Similarly, major abstracting services like, Chemical Abstracts, Physics Abstracts, Engineering Abstracts, etc. are also available on Internet. Thus, in the future users will be less dependent on library and more on the online sources and service agencies providing real time reference services. Users may also tap required information at home by means of a computer. At the same time, the cost of the services will be quite high to afford by the users. And users will continue to get the information at less cost from the library. Also specific and accurate information will be on great demand. Since users often may not be able to find specific information, they have to depend on trained reference specialists. So more expert reference librarians will be needed in the future.

For researchers to be productive and to be able to use information round the clock on 24/7 basis, from any location, the information has to be organised accordingly and made available to the users by the reference librarian. No library can provide reference service entirely based on its own collections, on all types of queries. Therefore, there will be a need to have collaborative ventures for reference service, in which location of reference sources, location of users, time, etc., will not be the constraints. Survivability of reference professionals and existence of libraries and information centres will depend upon the quality and efficiency of reference services provided by them. The future of reference service will also be based on the digital collections and communication links through web, because digital technology has opened new ways of storing and accessing information. Whatever direction and which shape the new technology is going to take in future; it will always help the reference librarian. In the coming era, the reference librarian will need the ability to read the situation in which a user will be able to find the right information on

his own, as and when he requires. Since many non-library organizations have started providing digital reference services to their clientele, libraries and information centres should turn their attention and to compete in the new environment to provide e-reference services and real time reference services. For users, the reference librarian is going to act as a hub if the library is well equipped with computer, Internet and CD-ROMs. Reference librarian and reference service will be a centre of the universe of information in the future.

11.10 SUMMARY

In this Unit, efforts have been made to define reference service and its needs to meet information requirements of the information seekers. A systematic approach to handle reference queries to provide right information at right time has been discussed. On the basis of requirements of the users, reference questions have been categorized into various categories and their mode of receipt and answering. In a modern library or information centre, manual system of handling reference queries can be replaced with computerised and an expert system. Various advantages of developing expert systems and their applications in reference service have been discussed in this Unit. Examples of collaborative digital reference service provided by the Library of Congress along with a group of more than hundred libraries, the Automatic Reference Librarian for the World Wide Web, the Virtual Reference Service and the 24/7 Reference, etc. have also been discussed which may be beneficial for other libraries and information centres which are planning to make a joint venture in this direction. These discussions will help students to understand basic concepts of reference service provided to the clientele manually as well as automatically through computer including their evaluation.

11.11 ANSWERS TO SELF CHECK EXERCISES

- 1) Reference service is a personalized service provided to the user to help him to find out documents answering his interest at the moment pin-pointedly, exhaustively and expeditiously.

Reference service is needed in a library to:

- satisfy information requirements of the users.
 - know about the tools and techniques developed for libraries and information centres for providing reference service to its users.
 - know the availability of volume and type of documents in conventional and non-conventional formats.
- 2) Reference service process is a process of satisfying specific and recurrent information needs of the users. It involves interaction between reference librarian and user. The following are the steps involved in the reference service process:
- Analysing the queries to understand the specific information requirement of the user.
 - Conducting reference interview to ascertain identify exactly the specific information requirement of the user.
 - Refining the user statement and transforming the query statement into search terms.
 - Formulating the search strategy.
 - Searching the information through matching process.
 - Notifying to the user.
 - Getting feedback from the user and evaluating it.
 - Evaluating the feedback received from the user.
 - Modifying the search strategy for full satisfaction of the user.

- 3) Digital reference service is an Internet-based question-and-answer service that connects the user with experts in a variety of subject fields and possessing specialized subject or skill experience. In addition to this, experts also provide users with referral to other online and printed information sources. Digital reference service can be broadly categorized into two groups:

E-Mail Reference Service: In this service, the user sends e-mail to the library with a reference question, seeking whatever information he feels necessary. The library sends reply by e-mail, fax, phone or letter as it finds convenient. When a query is sent by a user, the controller of the query in the library first receives it and examines and then routes it to the appropriate people who can handle the query. Technical questions are forwarded to technical staff, circulation-related questions to the circulation staff, reference question to the reference librarian, and so on. Examples of prominent e-mail reference services are: Askme, AllExperts, Inforocket, Xrefer, Reference Desk, Infoplease, etc.

Real Time Digital Reference Service: In real time digital reference service, the exchange of information is live (it takes place in real time) between the user and the reference librarian. Examples are: Ask A Question, Ask Now!, Ask The Librarian, Real Time Reference, Virtual Reference Desk, etc.

The followings are the some of the measures/components for assessing the quality of digital reference services rendered by any library or information centre or organisation.

- Outcome Measures (Quality of Answers)
- Process Measures (Effectiveness and Efficiency of Process)
- Economic Measures (Costing and Cost-effectiveness)
- User Satisfaction (Degree of Satisfaction)

- 4) Some of the major digital reference service projects are:

- *Collaborative Digital Reference Service (CDRS):* This project was launched by the Library of Congress in June 2000. At present, more than 100 libraries from various countries are participating in this collaborative venture. It is a library-to-library network for asking and answering reference questions. Conceptually, the CDRS has three components:
 - *Members Profiles (MP)*, which contain information on strengths and features of the members including addresses, hours of services, strengths of collection and staff, what is out of scope, geographical locations of the users served, any special service, average number of questions received, etc.
 - *Request Manager (RM)*, a software for entering, routing and answering reference questions including receiving, sorting out routing and tracking down the incoming questions and delivering the credible answers to the end user.
 - *Knowledge Base (KB)*, a searchable database for questions and answers sets including archiving of questions and answers for future use.
- *Automatic Reference Librarians for the World Wide Web:* This project was sponsored by the University of Washington to create software agents that possess reference intelligence – a limited understanding of complex technical topics, but a very sophisticated understanding of how and where to find high quality information on the World Wide Web. It works on the basis of wrapper technology.

- *Virtual Reference Desk (VRD)*: This project is sponsored by the US Department of Education. It is dedicated to the advancement of digital reference and the successful creation and operation of human-mediated, Internet-based information service. The VRD does not actually answer questions, but provides resources and links to experts that offer these services. This service includes:
 - *Collaborative Ask A Service*: A network of Ask A Services and volunteer information professionals that ensure users' questions are addressed by the most appropriate experts.
 - *The Learning Centre*: A web site for the K-12 community with curriculum-related websites, frequently asked questions, and other previously asked questions.
 - *Ask A+ Locator*: A searchable database of high quality K-12 Ask A Services.
 - *24/7 Reference*: A pilot network established in the California Los Angeles and Orange County areas to provide real time reference services directly to the library patrons over the Internet.
- 5) Expert System is a knowledge-based computerised system, which plays a vital role in making interface for providing access to databases and to obtain relevant information. It contains knowledge about the subject areas, technique to formulate search profiles and obtains appropriate solutions for the problems. Advantages of an expert system in handling reference queries are:
- An expert System is helpful in storing complete library collections which can be located within a short duration of time.
 - It can be a multi-user accessible system.
 - It can work beyond the prescribed time, i.e., round the clock.
 - Reference queries can be made from remote places and answers received.
 - Many libraries can be linked electronically to pool their resources, which can create an exhaustive collection.
 - The system can save the search result for future use.
 - It can also be helpful in evaluation of library collections, and their usefulness.

11.12 KEYWORDS

Expert System	: It is a knowledge-based computerized system, which plays a role of intelligent interface for providing access to databases and to obtain relevant information.
Reference Query	: Any request by a library user for information or assistance in locating information.
Reference Service Process	: It is a process of answering questions or satisfying specific, recurrent information needs.

INFORMATION SEARCH REQUEST FORM

Please enter your specific information requirement. The specificity would help us to analyse your topic to provide relevant information. Please use one Form for each request.

1. Type of Organisation Research Academic Others
2. Official Address:

Name.....Designation.....

Organisation /Institution.....

Place.....City.....PIN.....

E-mail.....Phone.....Fax.....
3. Name of your research/project, Head/Guide.....
4. Title of your research/project work.....
5. Description of research/project work (about 100 words. Please attach a sheet if necessary).....
6. List subject keyword(s) of your research/project work. (Explain abbreviations/synonyms, if any, and use CAPITAL LETTERS only)

	Keywords	Abbreviations/Synonyms
1.	_____	
2.	_____	
3.	_____	
4.	_____	
5.	_____	
6.	_____	
7. Are you aware of any relevant papers published on the same topic as your research/project Yes No

(If 'Yes' please give title, author, journal/conf. Name, volume number, and year)

a)

b)
8. Specify the format in which information is required?

Bibliography only Bibliography with Abstracts
9. Type of documents you wish to include?

All categories Journal papers Conference papers

Standards Patents Others (Pl. mention)

10. Languages you wish to cover? English All Languages

Signature: _____ Signature of the

Date: _____ Research/Project Head/Guide



For Office Use:

Search Strategy

.....
.....
.....
.....

Sl.No.	Database(s) Searched	Period	No. of References
1.			
2.			

DIGITAL REFERENCE SERVICE - REQUEST FORM

Name:

Designation:

Library Membership No :

E-Mail Address :

Telephone No: (Office): (Residence):

Fax:

Enter your request here (please state clearly in about 50 words or more. Better specificity will help us in providing specific information. Use the space on the reverse if necessary):

.....

Language acceptable(Please tick): ___ English/German/Russian/others please specify

.....

Preferred database(s) or source(s) to be searched (if known):

Preferred format: Print/Soft copy

Submit

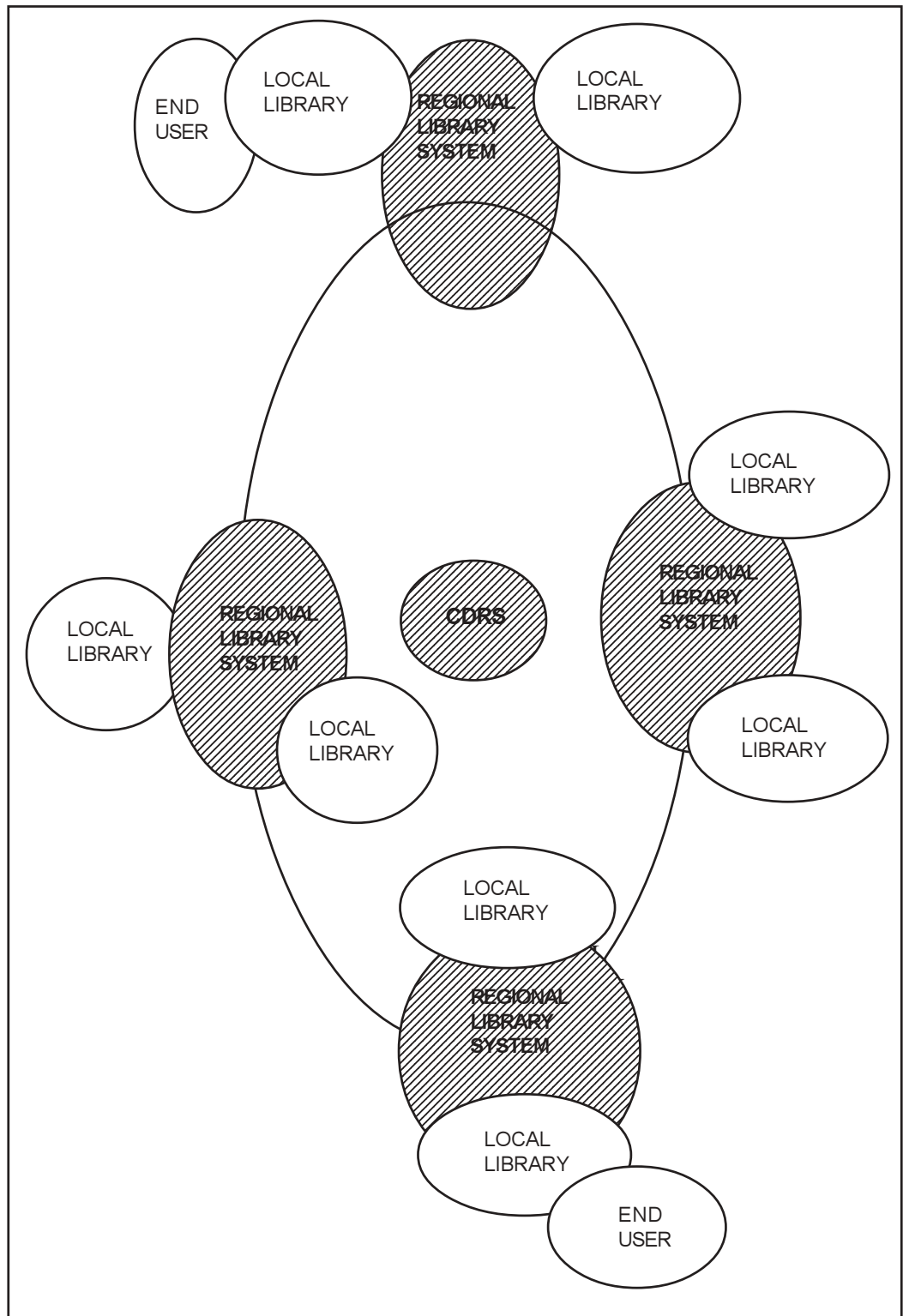


Figure 11.1: CDRS Network

11.13 REFERENCES AND FURTHER READING

American Library Association. (1983). *Glossary of Library Terms with a Selection of Terms in Related Fields*. Chicago: American Library Association.

Breeding, M. (2001). Providing Virtual Reference Service: Libraries are Finding Ways to Expand Services to Remote Library Users. *Information Today*. 18(4), 42-43.

Bunge, C.A. (1999). Reference Services. *Reference Librarian*. 66, 185-199.

Chisman, H. and Treat, W. (1984). An Online Reference System. *RQ*. 23(4), 438-445.

- Chowdhury, G.G. (2002). Digital Libraries and Reference Services: Present and Future. *Journal of Documentation*, 58(3), 258-283.
- Coffman, S. and Saxton, M.L. (1999). Staffing the Reference Desk in the Largely Digital Library. *Reference Librarian*. 66, 141-161.
- Collaborative Digital Reference Service. <www.loc.gov/cdrs>; <www.oclc.org/services/reference/cdrs.htm>
- Gray, S.M. (2000). Virtual Reference Services: Directions and Agendas. *Reference & Users Services Quarterly*. 39(4), 365-375.
- Hutchins, Margaret. (1944). *Introduction to Reference Work*. Chicago: American Library Association.
- Janes, J.; Hill, C. and Rolfe, A. (2001). Ask-an-Expert Services Analysis. *Journal of the American Society for Information Science*. 52(13), 1106-1121.
- Katz, William A. (1997). *Introduction to Reference Work*. New York: McGraw-Hill.
- Kresh, D.N. (2000). Offering High Quality Reference Service on the Web: The Collaborative Digital Reference Service (CDRS). *D-Lib Magazine*, 6(6).
- Krishan Kumar. (1996). *Reference Service*. 5th rev.ed. New Delhi: Vikas Publishing.
- Lankes, R.D. [et al.] (ed.). (2000). *Digital Reference Service in New Millennium: Planning, Management and Evaluation*. New York: Neal-Schuman.
- Lankes, R.D. [et. al.]. *Assessing Quality in Digital Reference Services*.
- Meredith, J.C. (1971). Machine Assisted Approach to General Reference Materials. *Journal of American Society for Information Science*. 22(3), 176-186.
- Morris, A. (1991). Expert Systems for Library and Information Services: A Review. *Information Processing and Management*, 2(6), 713-724.
- Oder, N. and Weissman, S. (2001). The Shape of e-reference. *Library Journal*. 126(2), 46-50.
- Parrott, J.R. (1986). Expert System for Reference Work. *Micro-computers for Information Management*. 3(3), 155-171.
- Ranganathan, S.R. (1989). *Reference Service*. 2nd ed. Bangalore: Sarada Ranganathan Endowment for Library Science.
- Sloan, Bernard G. (1998). Electronic Reference Services: Some Suggested Guidelines. *Reference & Users Services Quarterly*. 38(1), 77-81.
- Spiller, David. (2000). *Providing Materials for Library Users*. London: Library Association.
- Tenopir, C. (2001). Virtual Reference Services in a Real World. *Library Journal*. 126(12), 38-40.
- Tenopir, C. and Ennis, L.A. (2001). Reference Services in the New Millennium. *Online*. 25(4), 40-45.
- Vickery, A. and Brooks, H.M. (1987). PLEXUS: The Expert System for Referral. *Information Processing and Management*. 23(2), 99-117.
- Virtual Reference Desk. (2000). Facets of Quality for Digital Reference Services. <<http://www.vrd.org/training/facets10-00.htm>>
- 24/7Reference. (2005). <<http://www.247ref.org/products.htm>>