



Digital reference services in university libraries of Pakistan

By

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ABSTRACT

The development of information and communication technologies, and wide spread of the Internet and its associated technologies have brought about tremendous changes in the reference department of academic libraries, and in the attitudes and expectations of both information professionals and users. Many academic libraries across the globe have embraced Web technologies to fulfil users' reference needs in a digital environment. This study aimed to investigate and analyse digital reference services in university libraries in Pakistan. It focused on the nature and level of digital reference services, technologies used for the provision of the service, usage, staffing, marketing, funding, ICT infrastructure available for the service, and looked at the issues faced by academic libraries in implementing and managing the service. A mixed methods research approach combining both quantitative and qualitative methods was employed to achieve the aim and objectives of the study. The quantitative data for the study were collected through an online survey. A total of eighty five university libraries (both in public and private sectors) from all the four provinces, the federal capital and Azad Jammu & Kashmir participated in the survey. The quantitative data were supplemented by the qualitative data which were gathered through semi-structured interviews with the heads of fifteen leading university libraries.

Findings suggest that digital reference service is at an early development stage in university libraries in Pakistan, with a small number of libraries offering the service. Most of the academic libraries which have implemented this cutting-edge service, are large libraries equipped with good human and technological resources. The libraries have mostly developed asynchronous digital reference systems by employing e-mail and web forms. The usage of the service is lower than that of in-person reference in academic libraries due to factors, such as libraries' failure to effectively market the service, lack of ICT skills among users, lack of ICT facilities available for users. It was found that the libraries lack skilled and competent LIS professionals to staff the service. Factors contributing to the scarcity of skilled human resources in academic libraries include the lack

of in-house training for DRS, shortage of continuing professional development courses in the country, and deficiencies in LIS curricula offered by the country's library schools. A number of issues which affect the implementation and management of DRS in academic libraries have been identified. They include: scarcity of competent human resources; access to appropriate digital resources; unavailability of suitable software for DRS; financial constraints; lack of ICT facilities; absence of a digital reference policy; lack of ICT application; paucity of resources; electricity supply; inadequate physical facilities; lack of local research and literature on DRS.

Keywords: reference services, digital reference services, university libraries, Pakistan.

DEDICATION

This work is dedicated to my parents, wife and son.

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LIST OF ABBREVIATIONS

AACR	Anglo American Cataloguing Rules
ACRC	Association of College and Research Libraries
ALA	American Library Association
ARL	Association of Research Libraries
BIOSIS	Bio Sciences Information Service
CAS	Chemical Abstract Service
CAS	Current Awareness Service
CBAC	Chemical and Biological Activities
CD-ROM	Compact Disk-Read Only Memory
CDRS	Collaborative Digital Reference Service
CDS/ISIS	Computerised Documentation System-Integrated Set for Information
DAI	Degree Awarding Institute
DRS	Digital Reference Service
EARS	Electronic Access to Reference Service
ERIC	Education Resources Information Centre
FAQ	Frequently Asked Question
GDP	Gross Domestic Product
HEC	Higher Education Commission
HOD	Head of Department
ICT	Information and Communication Technology
IFLA	International Federation of Library Associations and Institutions
ILL	Interlibrary Loan
IM	Instant Messaging
INASP	International Network for the Availability of Scientific Publications
Inspec	Information Service for Physics Electronics and Computing
IPL	Internet Public Library
IT	Information Technology
KULSAA	Karachi University Library Science Alumni Association

LABELNET	Lahore Business and Economic Libraries Network
LC	Library of Congress
LIMS	Library Information Management System
LIRN	Library Information and Reference Network
LIS	Library and Information Science
LLB	Bachelor of Law
LUMS	Lahore University of Management Sciences
M.Phil	Master of Philosophy
MARS	Machine Assisted Reference Section
MART	Management of Agriculture Research and Technology
MBA	Master of Business Administration
MCLS	Metropolitan Cooperative Library System
MEDLARS	Medical Literature Analysis and Retrieval System
MEDLINE	Medical Literature Analysis and Retrieval System Online
MELAP	Medical Library Association of Pakistan
MLA	Museums, Libraries and Archives Council
MLSc	Master of Library Science
MMR	Mixed Methods Research
MPhil	Master of Philosophy
NARC	National Agriculture Research Council
NDL	National Digital Library
NLDP	Netherlands Library Development Project
NTC	National Telecommunication Corporation
NWFP	North Western Frontier Province
OCLC	Online Computer Library Centre
ODLIS	Online Dictionary for Library and Information Science
OPAC	Online Public Access Catalogue
OPEC	Organisation of Petroleum Exporting Countries
PakLAG	Pakistan Library Automation Group
PASTIC	Pakistan Scientific and Technological Information Centre
PBWG	Pakistan Bibliographical Working Group
PC	Personal Computer
PERI	Programme for the Enhancement of Research Information
PERN	Pakistan Education Research Network

PhD	Doctor of Philosophy
PLA	Pakistan Library Association
PPLDP	Pakistan Parliamentary Libraries Development Project
PRR	Pakistan Research Repository
PTCL	Pakistan Telecommunication Company Ltd.
PULSAA	Punjab University Library Science Alumni Association
RASD	Reference and Adult Services Division
RS	Resource Sharing
RUSA	Reference and Users Services Association
SDI	Selective Dissemination of Information
SDNP	Sustainable Development Networking Programme
SPIL	Society for the Promotion and Improvement of Libraries
UESTP	Universities of Engineering, Science and Technology in Pakistan
UGC	University Grants Commission
UNESCO	United Nations Educational, Scientific and Cultural Organisation
VoIP	Voice over Internet Protocol
WINISIS	CDS/ISIS for Window

Chapter 1: Introduction

1.1 Background of the Study

This dissertation is concerned with the position and potential of digital reference services in university libraries in Pakistan. Reference service, sometimes referred to as 'reference and information services' or 'reader services', is personal assistance provided to users in the pursuit of information (Bunge, 1999, p. 185). Libraries provide reference services in order to mediate between users' information needs and the information resources accessible to the users through the libraries. Reference services continue to exist in libraries because the users are usually not conversant with how to access information, and how to use information resources. Reference services may range from a minimal level of assistance to the users in finding information on their own to the actual provision of information to the users (Smith, 2010, p. 4485).

Reference services were traditionally offered by a reference librarian at the reference desk within the library building during face-to-face meeting between the user and the librarian, over the telephone, by fax and through mail. The reference librarian used a library's print reference sources to provide required information to the users. Many libraries started to set up a separate reference section, which contained reference material and was staffed by a reference librarian. Smith (2010, p. 4485) notes that, "The work of reference librarians includes selection of an adequate and suitable collection of reference sources and arrangement and maintenance of the collection so that it can be used easily and conveniently".

The introduction of the Internet and its associated Web technologies have changed both the way libraries provide information services to their users and the way the users prefer to access information (Chowdhury and Margariti, 2004, p.50). Developments in information and communication technologies have affected both reference work and reference sources. Print reference sources kept in reference sections in libraries are now supplemented by databases and Web resources (Smith, 2010, p. 4485). With the development of the Internet

and the World Wide Web, and the introduction of interactive technologies, such as e-mail, web form, web chat, instant messaging, the way the reference service was provided has drastically changed. Today, besides helping the users at the reference desk, the reference librarian provides them reference services in cyberspace by employing Web technologies. This new service, known as digital reference service (DRS), is “a mechanism by which people can submit their questions and have them answered by a library staff member through some electronic means (e-mail, chat, Web forms, etc.), not in person or over the phone” (Janes, Carter and Memmott (1999, p.146).

DRS has had a great impact on all types of libraries. It has expanded reference service from the physical reference desk to virtual reference desk. Now it is possible for the users to submit their questions and receive answers from anywhere at any time. Janes, Carter and Memmott (1999) state that:

“Digital reference encompasses two old ideas: that one of the primary professional functions of a library and its staff is to help people find information, and that libraries and librarians should take advantage of new technologies to aid them in their work. Digital reference is merely the most recent in a long string of examples of librarians examining new technologies, learning about them, and incorporating them in their daily work, extending not only their own professional capabilities but the reach of those technologies”(p.145).

Academic institutions play an important role in society by enabling future generations to utilise the acquired knowledge to fulfil their responsibilities more effectively. The libraries of these institutions collect a variety of information sources and provide various services to different users, such as faculty, students, staff and administrators. The basic function of academic libraries is to support instructional, learning and research activities of academic institutions (Abdoulaye and Majid (2000, p.381). Academic libraries need to meet information needs of the academic and research community effectively by improving their services and enhancing their resources. The provision of an effective reference service helps to enhance exploitation of resources. The speed, convenience and accessibility have a great bearing on users' satisfaction. As new technologies have been introduced, the academic libraries

need to redesign their reference services by applying the technological innovations in order to provide better and efficient reference services.

Today, many academic libraries throughout the world have started providing DRS to their students, faculty and staff. Katz (2003a, p.1) also notes that, “Real time digital reference services are now a standard part of reference work in medium to large sized libraries as well as numerous smaller libraries”. DRS brings many benefits to students and helps them greatly to undertake their research and studies. This service provides more opportunities for undertaking research because a user needs not to be local or even physically come to the library. It has the potential to reach users at their own location, and answer their queries and provide their required information. It facilitates greatly distance education which is most popular in academic institutions nowadays. Tenopir and Ennis (2002, p.264) report that:

“There is no doubt that the Internet and, in particular, the World Wide Web has transformed university reference departments. Today we take for granted Web-based online catalogues, library-provided portals to quality Web sites, and a plethora of commercial online databases, the most popular of which are Web versions. Hundreds of workstations, complex internal and external network connections, and a mix of in-house and online resources define reference services of the twenty-first century”.

1.2 Statement of the Problem

The main functions of reference services have remained constant. The difference that exists now is primarily in the tools that are used for reference services. The reference librarian has incorporated a host of new tools and technologies to help provide reference services. Apart from developments in technology, many changes have occurred in communities. Today, communities have become more diverse economically, racially and ethnically than those that existed about a century ago. The library needs to redesign itself in order to meet the changing information needs of new communities. The librarian is required to provide services to the community wherever it is located. The technology has

expanded the reach of the library to the community and the community's demand on the library as well (Tyckoson, 2003, p.15). Smith (2010) states that:

“In this information-rich world, information can be sought anytime, anywhere. Now users have alternatives that are more convenient than coming to a physical library at set hours to consult with a reference librarian. As a result, reference librarians have to find ways to respond to contemporary users' values and expectations of immediacy, interactivity, personalisation, and mobility. If reference services are to be used, attention must be given to minimising the time, the effort, and the difficulty of use” (p. 4486).

McClure et al. (2002, p. 1) note that people feel comfortable in utilising and depending on digital services in their day-to-day ways of life. For instance, many people now shop, make bank transactions and pay their bills with the help of various electronic and digital technologies. People also communicate with others in their personal and business lives by using e-mails or real-time services, such as instant messaging, online chat, and video conferencing. In the context of librarianship, users expect their libraries to provide more services online, including access to electronic information resources and online catalogues, the facility to place requests online and the provision of some sort of DRS, as they expect to be able to find the answer to every query online.

Academic libraries have undergone major shifts in technology over the last two decades. The emphasis has shifted from processing printed materials to providing access to information via the Web. Academic libraries are challenged to provide the greatest information access and an improved level of reference and information services by keeping pace with the latest trends and technological developments.

In Pakistan, university libraries have been in a better position in terms of resources and services as compared to other types of libraries, such as public, special and school libraries. Some of the university libraries have made advances in the digital era and started to provide electronic services including DRS. There is a need to explore the status of DRS in university libraries in Pakistan, and to look at its implementation and management.

1.3 Scope of the Study

The present research includes central libraries of all universities and degree awarding institutions (both in the public and private sectors) in Pakistan. There were 134 universities and degree awarding institutions recognised by the Higher Education Commission of Pakistan, when this study was conducted (see Table 4.2). All these institutions of higher learning have libraries which support their research and learning activities.

1.4 Aim and Objectives

The aim and objectives of the research study are mentioned below:

1.4.1 Aim

The aim of this study is to investigate and analyse DRS in university libraries in Pakistan.

1.4.2 Objectives

The objectives of the study are:

- i. To gain an overview of the development of, and trends in, DRS in modern university libraries.
- ii. To acquire an overview of reference services (traditional and digital) being provided in university libraries of Pakistan.
- iii. To identify and analyse the nature and level of DRS being offered in university libraries of Pakistan.
- iv. To explore various aspects pertaining to the management of DRS in university libraries of Pakistan.
- v. To identify the ICT infrastructure and technologies used for DRS in university libraries of Pakistan.
- vi. To identify issues and challenges related to the implementation and management of DRS in university libraries of Pakistan.

- vii. To make recommendations for effective implementation and management of DRS in university libraries of Pakistan.

1.5 Research Questions

The purpose of this study is to answer the following questions:

- I. What are the trends in DRS in modern university libraries?
- II. What is the status of reference services (traditional and digital) in university libraries of Pakistan?
- III. What is the nature and level of DRS being offered in university libraries of Pakistan?
- IV. What are various aspects pertaining to the management of DRS in university libraries of Pakistan?
- V. What ICT infrastructure and what technologies are used for DRS in university libraries of Pakistan?
- VI. What are issues and challenges related to the implementation and management of DRS in university libraries of Pakistan?

1.6 Significance

A review of the literature revealed that no comprehensive study regarding DRS in academic libraries in Pakistan has been conducted previously. This study provides an insight into the current status of DRS in academic libraries in Pakistan. It contributes to the understanding of the nature, level, usage and different important aspects related to management of the DRS in the academic libraries. It identifies issues affecting the implementation and management of the DRS in the academic libraries. The study provides recommendations for effective implementation and management of the DRS in academic libraries in Pakistan, which are intended to help those academic libraries which are offering the DRS to improve their services, and guide the academic libraries which are planning to implement this service. As no extensive research has been conducted in this area in Pakistan, the study also fills the gap in the LIS literature related to this area.

1.7 Organisation

The study is organised in eight chapters, appendices and references:

Chapter One: presents an introduction to the study. It includes the background of the study, statement of the problem, scope, the aim and objectives, research questions, significance and organisation of the study.

Chapter Two: consists of a review of the literature that covers the background of reference services, types of reference services, concept and development of DRS, kinds of DRS, guidelines for DRS, DRS in academic libraries.

Chapter Three: presents the background to the research. It includes an overview of Pakistan, its education system, higher education and higher education institutions. The chapter further describes the development of academic libraries in the country, services provided by the academic libraries, development of ICT in academic libraries, DRS in academic libraries, problems faced by academic libraries and LIS education in the country.

Chapter Four: discusses the philosophy of the research, research design, research methods, and collection and analysis of data.

Chapter Five: presents the analysis of the quantitative data collected through the questionnaire survey.

Chapter Six: presents the analysis of the qualitative data collected through semi-structured interviews.

Chapter Seven: provides an overall discussion of the research findings.

Chapter Eight: presents conclusions and recommendations.

Chapter 2: Literature Review

2.1 Introduction

This chapter presents a review of the literature surrounding DRS and its implementation in modern libraries, with special reference to academic libraries. Accordingly, it begins by giving a brief account of the background of reference services and the various kinds of reference services. It then discusses the development of DRS in libraries. Next, this chapter describes various kinds of DRS, and technologies used for the provision of DRS.

2.2 Background to Reference Services

Libraries started to be founded from ancient times. Of the most celebrated libraries of early times were those established at Nineveh in 700 BC and the library at Alexandria in Egypt in 300 BC (Brophy, 2000, p 24). These libraries contained humankind's knowledge recorded on different types of materials. They were considered the 'storehouses of knowledge' and were mainly entrusted with the tasks of acquiring, organising and preserving of knowledge. Before the mid-1800s, the majority of the members of any community were illiterate and they had no interest in a library. Only the nobles of society were interested in the library and could have access to the knowledge contained in the library (Tyckoson, 2003, 13). Latin, which was the language of learning almost all over of Europe and used by clergy, nobility and scholars to read and write, ceased to be the international language in the early modern Europe. Literature in different disciplines started to be produced in modern languages which led to the development of widespread literacy and demand for public education across Europe (Houston, 1988, pp.9-25). With the development of the concepts of public education and democracy throughout the world, members of each community started to obtain reading skills. As members of the community using the library increased, the library started to offer services to help them in the use of its resources. In this way reference service came into existence.

Katz (2002a, p.4) notes that “The invention of printing in the mid-15th century, the wide distribution of books by the 16th century, the growth of literacy among the middle classes in the 17th and 18th century, and the 19th century’s mass education movement increased both the amount and the demand for information. As early as the mid-18th century, people were complaining there simply was too much to read, too much to know”. Smith (2010, p.4485) observes that the provision of reference services started in libraries in the late 18th century. Janes (2003, p.22) notes that reference service emerged in libraries in the late nineteenth and early twentieth centuries in order to respond to several forces and trends such as:

- a. an increase in the number and variety of information resources available in libraries and outside;
- b. the complexity of information resources;
- c. the difficulty faced by people in finding the required resource and in locating the particular information within that resource;
- d. an increase in the number and diversity of library users which led to a wider range of information needs, queries and sophistication for searching information.

Until the middle of the nineteenth century, modern facilities, such as heating and lighting developed slowly in all types of libraries in Europe. In order to make studying comfortable, small reading rooms were made available for reading purposes in the larger libraries, which could be easily heated. The books were kept in separate rooms. The rapid growth in the amount of scholarly literature required libraries to arrange stacks close together to increase storage capacity. Moreover, during the second half of the nineteenth century, many new universities were established in Western Europe and academic communities doubled in some countries which depended on university libraries to support their research and learning activities. However, library resources (human and material) did not increase proportionately, which made it difficult for library staff to process new books and cope with greater demands for services. As a result, backlogs of unprocessed books developed. In order to deal with this complicated situation, libraries abandoned subject arrangement of the literature

on shelves and started to arrange material according to accession numbers, thus making it unprofitable for users to go to the stacks as material related to a specific discipline was no longer found together. All these factors obliged libraries to close their stack areas to users. The user had to request a library staff member to provide him with the required item by giving its title or call number obtained from the catalogue (Rovelstad, 1976, pp. 459-462; Brunt, 2006, p.577). It provided the user with an opportunity to seek assistance from the library staff member in finding his required source of information, thus led to the development of reference services in libraries.

Kaplan (1947, p.286) suggests that “Modern reference service is marked by four distinctive features: (1) the willingness and ability of librarians generally to give reference aid; (2) a staff devoted exclusively to reference work; (3) reference collections stored on open shelves in rooms planned as reference quarters; and (4) ready guides to library resources”. By the fourth quarter of the nineteenth century these features of reference service had started to emerge. There were few librarians who had either the will or the knowledge required to offer a reference service. At that time the reference collections comprised a few called-for books which were kept in a reading room meant for periodicals and newspapers. In some libraries reference books were placed behind a railing or desk in order to protect them from theft (Kaplan, 1947, p.286).

Historically, the concept of reference service was introduced by Samuel Swett Green of the Worcester Public Library in Massachusetts, USA in his 1876 paper on ‘Personal Relations between Librarians and Readers’ (Tyckoson, 2003, p.13; Bunge, 1999, p.186; Smith, 2010, p.4485; Kaplan, 1947, p. 286; Cassell & Hiremath, 2009, p.3). Green (1876) identified four components of reference service which are considered as the basic functions of reference service even today:

- I. “instruct the reader how to use the library;
- II. answer the reader’s queries;
- III. aid the reader in the selection of good reading material; and
- IV. promote the library within the community.”

Tyckoson (2003, pp.13-14) observes that the four functions stated by Green (1876) are considered the core of reference service today. The purpose of the first function, instruction, is to help library users to learn how a library is organised so that they can benefit from its resources. The second function, answering the user's questions, is considered the most important part of reference service in recent years. Green's third function of reference service, aiding the reader in the selection of good library materials, serves as the link between the reference librarian's knowledge of library resources and the user's needs. The final component is to promote the library within the community it serves. Green (1876) believes that a library would be promoted in the community if the work of, and services offered by a reference librarian are recognised by its members.

Bunge (1999, p. 186) reports that until the publication of Green's paper, the main functions performed by a library were acquisition and organisation of library materials, and users were supposed to use their required materials on their own. Green (1876) notes that the users need a great deal of assistance as they have neither the skill nor the time to search for their required information in the library. So, the librarian should help them to find the information. He calls upon the librarian to instruct the users in the use of different library resources. He also urges the librarian to provide guidance to the users in the selection of recreational reading materials or in the conduct of research into specific areas. Green (1876) argues that friendly personal assistance to the users would promote the library in the community it serves. He suggests that the transaction between the librarian and the user should be the same as it is between a shopkeeper and a customer, as he states "A librarian should be as unwilling to allow an inquirer to leave the library with his question unanswered as a shopkeeper is to have a customer go out of his store without making a purchase" (p.79).

Green's ideas regarding the provision of personal assistance to users were presented at a time when printed library aids like the dictionary catalogue and the Dewey Decimal Classification System were starting to be used in the library in order to locate library resources. The need for special trained staff for the

provision of assistance to the users in the library gained wide acceptance during the 1880s and 1890s. By the 1890s, this new library activity, earlier known as 'assistance to readers', was replaced by the term 'reference work' (Kaplan, 1947).

Bunge (1999, pp.186-187) notes that a number of features of reference service, such as the 'information desk' to deal with directional queries, 'reader's advisory service' to assist readers in selecting materials and subject specialist reference librarians and departments were developed from 1918 to 1940. Proponents of reference service realised the importance of this service and developed the basic concepts and methods of reference work in the first half of the 20th century.

Smith (2010, p. 4486) states that with the growth of library collections, reference service kept on developing and library organisations became more departmentalised during the 20th century. The development of reference service as an area of specialisation was evident from the establishment of the Reference Services Division by the American Library Association (ALA) in 1957. The Reference Services Division was renamed as the Reference and Adult Services Division (RASD) in 1972, which later became the Reference and User Services Association (RUSA) in 1996. RUSA is responsible for stimulating and supporting the delivery of reference services to library users of all ages. It has formulated standards and issued guidelines for the development and delivery of reference services (Macikas, 2010, p. 4481).

Reference service is the provision of information or personal assistance in finding required information by the librarian to users (Hutchins, 1944, p.10; Rothstein, 1964 p.37; Bunge, 1999, p. 185). Bunge and Bopp (2001, p.3) note that personal assistance is the essence of reference service and is the fundamental role of the reference librarian. The goal of the reference librarian is to meet the information needs of the users.

Reference service consists of three major elements: (1) information services that involve either finding the required information on behalf of the users, or

assisting users in finding information; (2) instruction in the use of library, consisting of helping users learn the skills required to use library resources and services; (3) user guidance, in which users are assisted in selecting the most appropriate information sources to meet their information needs (Bunge, 1999, p. 185). Cassell and Hiremath (2009, p.3) state that reference and information services are an important part of the function and mission of all types of libraries. Although the advent of electronic resources and information and communication technology has changed the nature of reference, this element of library services has become even more important. They observe:

“Despite the many transformations that have been wrought on reference work by both developments of our information society and paradigm shifts in the self-understandings of the library, much has remained the same. First and foremost, it is still a service in which the librarian interacts with a person on a one-to-one basis. This level of personal service has become even more important in the twenty-first century in light of the alienating and depersonalising effects of many information technologies” (p.4).

2.2.1 Types of Reference Services

Smith (2010, p.4487) points out different types of reference service, such as ready reference service, reader’s advisory service, research consulting, instruction, and bibliographic verification and interlibrary loan. He notes that a reference librarian may perform all of these tasks or he may specialise in any specific activity, such as reader’s advisory service or instruction. Cassell and Hiremath (2009, p. 4) categorise information service into three types: ready reference; research and bibliographic verification.

Proponents of reference service had different views regarding the nature and extent of reference service provided to users. Academic librarians were of the opinion that the users should only be instructed to become independent users of library resources. This is referred to as the ‘conservative’ philosophy of reference service. Librarians of special libraries argued that the reference librarian should find the information himself and provide it to the inquirer. This is often referred to as the ‘liberal’ reference philosophy. The majority of public and academic librarians adopted the ‘moderate’ philosophy, which balances the

desire to provide assistance to the users keeping in view the capacity of the library staff, in terms of time and training, to do so. The supporters of the above three philosophies ultimately agreed that the users' needs vary at different times. Therefore, reference service should consist of information, instruction and guidance keeping in view the needs of a particular user at a particular time (Bunge, 1999, pp. 187-188). Bunge and Bopp (2001, p.6) observe that reference service has three basic types: the provision of information; instruction in the use of library and its resources; and guidance in the selection of materials. These three types of reference service are different in theory, but in practice they may be performed together. It may be possible to conduct elements of all three types of reference service during an interaction with one user at a given time.

2.2.1.1 Information Services

Bunge (1999, p.193) states that libraries provide information services to users on their request in order to meet their specific needs. Bunge and Bopp (2001, p. 7) point out that information services have different forms. They may range from provision of merely an address or telephone number to supply of documents on a specific topic. Information services include the following types.

2.2.1.1.1 Ready Reference Questions

Answering ready reference questions is one of the basic forms of information services. A ready reference question is a request for factual information, such as an address, the spelling or definition of a word, a date or place of an event. It could also be a request for brief information regarding an organisation. It can be answered quickly by consulting one or two reference sources. A wide range of reference sources, such as dictionaries, encyclopaedias, directories, yearbooks, biographical and geographical sources are used to answer ready reference questions. The majority of reference questions received at most reference desks in academic and public libraries fall under the category of 'ready reference questions' (Bunge and Bopp, 2001, p.7).

2.2.1.1.2 Bibliographic Verification

Bibliographic verification is another form of information services, which is offered in most of the libraries. It is concerned with the provision of information about specific publications. It involves searching of bibliographic tools to verify the user's information about a particular information source (Bunge and Bopp, 2001, p. 7).

2.2.1.1.3 Research Questions

Research questions are complex and take more time as compared to ready reference questions and bibliographic verification. These questions require a reference librarian to consult a wide variety of information sources to provide an answer (Cassell and Hiremath, 2009, p.5). Katz (2002a, P. 18) states that "A research query is usually identified as that coming from an adult specialist who is seeking detailed information to assist in specific work". He notes that the research request is often made by a professor, a scientist, a business executive or any other person who requires information for a particular decision or solution of a problem. Research questions are asked in most of the academic and special libraries, and in large public libraries as well.

2.2.1.2 Instruction

Instruction is considered a main component of reference service in almost all types of libraries. It is carried out with individual library users as well as users' groups. Instruction consists of three basic forms: (1) to teach how to use the library; (2) to suggest strategies for finding and assessing information; and (3) to instruct in the use of particular information sources. Instruction has sometimes been considered as an alternative to information services as it emphasises the need of teaching users to find information themselves instead of finding it for them. However, instruction is considered complementary to information services in a broader context. Information sources are increasing so rapidly that it is very difficult for users to know the extent of information available on a topic of their interest. Users also do not know about the existence, content and organisation of various information sources. Therefore, all types of libraries are required to

provide instructions to the users in the use of information sources (Bunge and Bopp, 2001, p.14).

2.2.1.3 Guidance

Guidance or reading guidance is concerned with suggesting appropriate materials to the particular users for reading. It was started in the 1920s in the form of 'reader's advisory service' in order to deal with a number of requests for advice on best books from users (Bunge, 1999, p. 191). Bunge and Bopp (2001, p.12) report that the concept of reader's advisory service was given by Samuel Green in his 1876 article, in which he laid emphasis on assisting users in the selection of books suitable to their needs and intellectual levels. Another form of guidance is 'term-paper counseling' or 'research consultation', which is provided in academic and school libraries. The reference librarian assesses a student's information needs and provides him with guidance as to which library tools should be consulted to find appropriate sources of information on the student's research topic, keeping in view the student's understanding of library use and search strategies (Bunge and Bopp, 2001, p.13).

2.2.2 Reference Interview

In order to answer a user's query, the reference librarian needs to get clarification of the question from the user so that the user is provided with the right information. This element of reference service is referred to as 'the reference interview' or 'question negotiation'. The basic purpose of the reference interview is to apprise the librarian of what information the user exactly needs (Bunge, 1999, p.194). Chowdhury (2002, p.259) notes that the reference interview not only helps the reference librarian to understand the user's particular information need but also helps him to obtain certain information about the user, which helps in finding the required information.

Hutchins (1944), and Cassell and Hiremath (2009) have devoted separate chapters of their books to describe various aspects of the reference interview. Selby (2007, pp. 35-46) has provided a brief account of history of the evolution of the reference interview from the traditional face-to-face transactions to the

chat reference interviews. Smith (2010, p.4488) states that “The purpose of the interview is to elicit from the user sufficient information about the user’s information need to enable the librarian to understand it enough to begin searching”. He notes that a reference transaction is started by a reference interview. The user’s query needs to be clarified before its answer is provided. The degree of interaction between the librarian and the user to answer a particular reference query depends upon the nature of question asked. Simple reference questions require a low degree of interaction for providing their answers, whereas complex questions take lengthy negotiations.

Katz (2002b, p. 125) states that “The reference interview, which takes place between the librarian with expert knowledge and the layperson in need of information, is a common form of communication”. He further adds that the reference interview identifies the true nature of reference service. Sutton and Holt (1995, p. 36) note that “A reference interview is a conversation between a member of the library reference staff and a library user for the purpose of clarifying the user’s needs and aiding the user in meeting those needs”. They argue that the reference interview has a specific purpose and structure, and it is different from general conversation between the librarian and the user. During the reference interview, the main goals of the reference librarian are to determine the quantity, nature and level of information required by the user. The reference interview also helps the librarian to decide as to which format of information is suitable to meet the user’s specific information need.

2.3 Digital Reference Services

2.3.1 Concept of Digital Reference Services

There are various definitions of digital reference services. LIS Wiki defines digital reference services as, “Library reference services offered online or electronically” (LIS Wiki, 2014). According to Kasowitz, Bennett and Lankes (2000, p.355), digital reference services can be defined as “Internet-based information services that use humans as mediators.”

Sloan (2002) cited in (Zanin-Yost, 2004, p.3) describes online or virtual or digital reference services as the provision of reference services that involves collaboration between the user and the librarian in a computer-based medium. These services can utilise various media, such as e-mail, web forms, chat, video, web customer call centre software, Voice over Internet Protocol.

RUSA (RUSA, 2010) has provided a comprehensive definition of virtual reference services:

“Virtual reference is 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. Communication channels used frequently in virtual reference include chat, videoconferencing, Voice over IP, co-browsing, e-mail, and instant messaging. While online sources are often utilised in provision of virtual reference, use of electronic sources in seeking answers is not of itself virtual reference. Virtual reference queries are sometimes followed-up with telephone, fax, in-person and regular mail interactions, even though these modes of communication are not considered virtual.”

Wasik (1999) describes digital reference and Ask-A services as Internet-based question-and-answer services that connect users with experts in a variety of subject areas. Besides answering questions, experts may also refer users to other online and print sources of information.

Berube (2003) notes that a digital reference service generally comprises four elements: (1) the user of the service; (2) the interface (e-mail, web form, chat, video, etc.); (3) the information professional; and (4) electronic resources (including electronic or CD-based resources, web resources, local digitised material), as well as print resources.

IFLA (2008), which devises and issues policies and guidelines for digital reference services, has defined digital reference services as follows:

“The term ‘virtual reference’, ‘digital reference’, e-reference’, ‘Internet information services’, ‘live reference’ and ‘real-time reference’ are used

interchangeably to describe reference services that utilise computer technology in some way...”

Throughout the literature related to digital reference services, the researcher found that terms like ‘digital reference services’, ‘electronic reference services’, ‘online reference services’, ‘live reference services’ and ‘virtual reference services’ are often used synonymously for the same type of services that use information professionals as mediators to assist users in finding information in a digital environment. Virtual or live reference usually refers to transactions that occur in real time, using chat technologies or videoconferencing; while online, digital, electronic reference includes reference transactions via e-mail or web form. However, these differences are quite often blurred (Berube, 2003). In the context of this study, the term ‘digital reference services’ is used for reference services that are provided over the Internet through different electronic means including e-mail, web form, chat, instant messaging, videoconferencing, Voice over Internet protocol, and that connect users with library staff.

2.3.2 Development of Digital Reference Services

In the early 1970s, online searching was introduced in libraries (Neufeld and Cornog, 1986, p.184; Stabler, 1993, p.16; Straw, 2002, p.4). It helped to process and access the vast amount of bibliographic information effectively. It also helped to compile research bibliographies online speedily and accurately (Straw, 2002, p.4). With the advent of online searching, a number of organisations started to produce databases and all the main indexing and abstracting services began to computerise their operations with a view to reducing production costs and time as much as possible to provide online access. The number of databases rose from 300 in 1975 to 2400 in 1984. In 1990, the most commonly used databases in academic and research libraries were MEDLINE, ERIC, BIOSIS, PsycInfo, Dissertation Abstracts, CAB, CA File, Inspec, Social Science Citation Index (Neufeld and Cornog, 1986, pp.184-185; Stabler, 1993, p. 17).

Straw (2002, p.5) notes that online searching was first introduced in the reference section of the libraries. In the UK, at the beginning, online searching

was conducted by scientists/subject experts or information professionals who acted as search intermediaries for end-users. Owing to factors, such as skills required to access online search services, knowledge of several command languages to communicate with the host computer, familiarity with subject scope and structure of different databases, charges involved in accessing online search services which were mostly based on the time spent online for doing a search, the end users were not perceived to be capable of doing searches on their own (Hartley et al. 1990, pp. 208-210; Armstrong and Hartley 1997, p. 6). As part of a British Library Research and Development Department research programme for studying the use of existing online bibliographic information systems, the University of Manchester Institute of Science and Technology explored attitudes and reactions of end-users to online information retrieval systems during 1974-75. The data were collected on the technical, economic and user aspects of the online bibliographic systems to assist scientists/information professionals to assess when and how to use those systems. A comparison was made between the queries searched by intermediaries and those searched by end-users on their own. The results revealed that intermediaries took about 43% of the time taken by end-users to conduct a search, and intermediaries retrieved 72% more references than the end-users. The study concluded that end-users could not be expected to operate a relatively complex information retrieval system without having required knowledge and expertise (Williams and Curtis, 1977). Tedd's study of twelve organizations in Britain and Europe in 1977 discovered that all organizations believed that online searching was best conducted by intermediaries (Tedd 1979 cited in Henry et al. 1980, p.97). In 1986, a survey conducted by the Association for Information Management revealed that 91 percent of online searches were carried out by intermediaries employed in British libraries and information units, while only 9 percent were done by the end-users (Sippings, Ramsden and Turpie, 1987 cited in Hartley et al. 1990, p.212).

Compact Disc Read Only Memory (CD-ROM) was introduced in libraries in the mid-1980s (Stabler, 1993, p.15; Straw, 2002, p. 7). A number of standard bibliographic databases and non-bibliographic materials, such as

encyclopaedias, dictionaries, directories and other reference sources appeared on CD-ROMs. CD-ROM was considered the first computer technology that helped the users to search and access computer database on their own (Straw, 2002, pp. 6-7). A survey of member libraries of the Association of Research Libraries (ARL) conducted in 1990 revealed that an average of twenty-one databases were available in these libraries on CD-ROMs (Stabler, 1993, p. 15).

With the advent of the Internet, libraries expanded the role of reference service beyond the use of mail, telephone and fax and started to provide reference service through the Internet. One of the first reference services provided through the Internet was 'Electronic Access to Reference Service (EARS)', which was launched by the University of Maryland Health Sciences Library, Baltimore, USA in 1984. This service started to provide reference assistance to users via e-mail (Still and Campbell, 1993, p.16; Wasik, 1999). The Indiana University Libraries developed an e-mail system named 'Libraries Information and Reference Network (LIRN)' and began to offer e-mail access to users in 1987 (Still and Campbell, 1993, p.16). In the early 1990s, a number of academic and public libraries started to provide reference services via e-mail. Some specific services meant for specific users' communities, such as Joan of Art (1993) (a service of the National Museum of American Art), ASKERIC (1992) (a project of the ERIC Clearinghouse on Information and Technology), and the Virtual Reference Desk (a collaborative service that provides support to Ask-an-Expert services) started to provide reference services via e-mail. The School of Information at the University of Michigan, USA launched IPL (Internet Public Library) in 1995. It was the first public library that provided e-mail based reference assistance, access to online collections and a story hour for children (Kresh, 2003, pp.20-22).

With the advent of the World Wide Web, libraries adopted the web form for submission of users' reference questions. A survey of 150 academic libraries in the USA, conducted in the middle of 1999, revealed that 67 libraries (44.7%) offered DRS to their users. Of these 67 academic libraries, 28 libraries provided reference service via e-mail, whereas 44 libraries offered the service through web forms (Janes, Carter and Memmot, 1999, pp.146-148). Apart from libraries,

different types of non-profit organisations started a number of ask-an-expert services on the Internet through web forms and e-mail. In addition to these non-profit educational services, some commercial websites also started to offer reference services through the Internet, for example “Abuzz”, which became much popular among the Internet users (Coffman and McGlamery, 2000 cited in Kasowitz, 2001).

At the beginning, libraries started to provide e-mail reference. With the introduction of the World Wide Web and proliferation of information and communication technologies, libraries began to explore and adopt various asynchronous and synchronous tools, such as web forms and chat products for reference transactions. Keeping in view the emerging requirements of libraries, software vendors started to design and develop products for DRS (Penka, 2003). As it is difficult to conduct a reference interview through e-mail, libraries tried to find some means to conduct a face-to-face transaction in the web environment, and started to use real-time reference tools ranging from chat technologies and instant messaging software to more sophisticated Web contact centre software. Chat technology that enables the reference librarian to communicate with the user in real time was first experimented by the Internet Public Library in 1995 (Kasowitz, 2001). Kresh (2003, p.21) points out that Bill Drew at Suny Morrisville, New York has the credit of initiating the first chat reference in 1998. The Santa Monica Public Library in California was first public library that started chat reference in 2000.

2.3.3 Types of Digital Reference Services

Keeping in view its organisation and delivery model, DRS can be divided into the following two broad categories (Berube, 2003 and Roesch, 2006).

2.3.3.1 Asynchronous Transactions

An asynchronous reference transaction is one in which a question is submitted in some form and its answer is provided at a later time. It involves communication with an information professional with no expectation of receiving an immediate response to the question asked. Berube (2003) notes that there is

a time delay between the question and answer in this transaction. Asynchronous DRS can be provided through the following media.

2.3.3.1.1 E-mail

Users can send their queries through e-mail either by clicking on the e-mail address given on the library webpage which activates software for e-mail, or they can send the questions to the library's e-mail address by using their own software. E-mail is regarded as the most popular form of communication as it is widely used, and it does not require extra software (Berube, 2003). Roesch (2006) notes that e-mail based reference service is cheap, and easy to implement and access. It helps to reduce the psychological barrier which prohibits some users from asking for assistance physically in the library. The reference librarian can attach and send data files to the users through e-mail. Another advantage of e-mail reference is that answers to particular questions can be stored in a knowledge base for future use. Meola and Stormont (2001, p.32) state that since e-mail reference allows reference staff to take time to formulate answers to questions, they can provide better responses. Disadvantages of e-mail reference include: (1) difficulty in conducting the reference interview; (2) delay in response; and (3) absence of non-verbal communication.

2.3.3.1.2 Web Form

A web form is accessed from the library homepage or the reference webpage and is sent back to the library after having been filled in by the user. The reference librarian usually provides an answer to the user's question through e-mail, phone, fax or post. Web forms usually contain some compulsory fields, for example for personal information and contact details, which need to be filled in by the users in order to provide them with answers. The users are also asked to provide some additional/optional information through web forms which help in identifying their information needs. Web forms help users to provide more details about their information needs which assist the reference staff in identifying their requirements more accurately (Roesch, 2006). Since web forms

provide the users a structured format for asking questions, they can guide them in framing their questions (Berube, 2003).

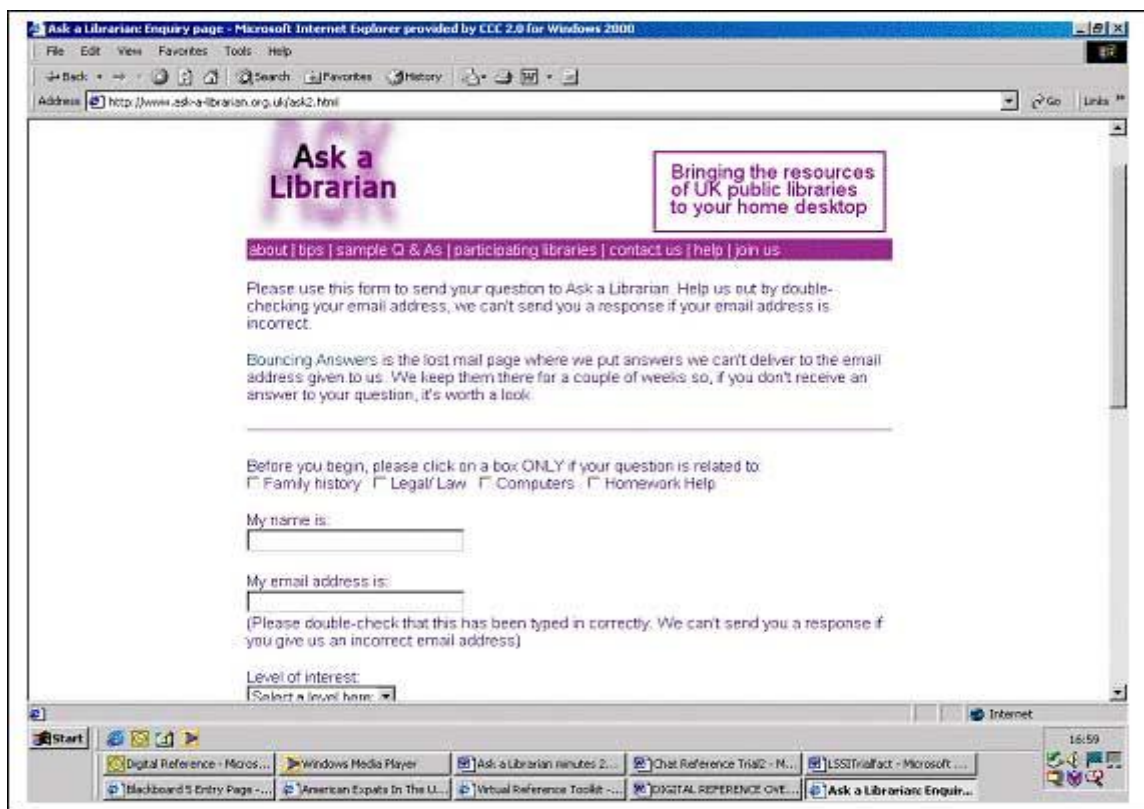


Figure 2.1: Enquiry Page/Web Form of “Ask a Librarian”, UK (adopted from Berube, 2003)

2.3.3.1.3 Chatterbots

Chatterbots are created by computer software which analyse the questions asked by users for keywords, match the keywords with particular answers already stored in the knowledge base and provide information to the users. In this form of DRS, the users communicate with an interactive database consisting of a wide range of pre-arranged information instead of a reference librarian. Chatterbots are technically similar to full-text search engines, and are represented by pictures (so called avatars) which portray the illusion of an online chat. The user fills in the relevant fields with his/her query and receives a response immediately. Chatterbots offer answers to particular questions, and are essentially FAQs which simulate a chat using artificial characters (Roesch, 2006). The most popular of this type of service is Ask Jeeves (Ask Jeeves, 2014).

2.3.3.2 Synchronous Transactions

A synchronous reference transaction is one that occurs at one period of time. It involves communication that takes place in real time (Berube, 2003 and Roesch, 2006). Live interaction between the user and the librarian occurs in this reference transaction and the user's question is answered immediately. It is also called live reference or real-time reference. Synchronous DRS can be offered through the following means.

2.3.3.2.1 Web Chat

Chat over the Internet enables the user to communicate with the reference librarian through brief written messages in real time. Both the librarian and the user are online at the same time and can respond to each other during chat. A separate window appears on the computer screen for typing and sending written messages (Roesch, 2006). Meola and Stormont (2001, p.34) consider the chat to be valuable for reference service as it helps remote users to communicate with the reference librarian in real time. They observe that "It has potential as an intermediate step between electronic mail reference and real time audio and video conferencing". The user needs to click on a link on the library web page and type a message in order to connect with the reference librarian.

Chat reference helps to conduct a reference interview in a virtual environment. The user can be provided with a copy of the whole dialogue after the completion of reference process. Another copy of the text can also be stored in an archive database for statistical information relating to the reference process, such as duration of chat, topics, locations of the users, etc. However, chat reference also has some disadvantages. Typing of messages can be irritating and awkward for some questions or users. Non-verbal communication is also not found in the chat reference transaction. It is not suitable for complex and research questions (Roesch, p.4, 2006).

2.3.3.2.2 Instant Messaging

Instant messaging (IM) is a form of chat communication which is widely used nowadays. Libraries have been using IM for DRS for some time. IM is very useful for DRS as it has become very popular among library users. IM helps the user and the librarian to communicate with each other over the Internet by using some special text-based software. The transaction through IM involves a split web screen. One screen is used by the user to type questions and to see the librarian's response and the other screen is used by the reference librarian for searching web pages or other electronic sources to find required information. IM allows the sending of data files and some of the IM software packages also provide opportunities for phoning over the Internet (VoIP) (Roesch, 2006, p.4; Berube ,2003).

IM/chat through the use of specific digital reference software packages, for example QuestionPoint (QuestionPoint, 2013), VRLplus (Altarama, 2014), can be combined with some special features, such as co-browsing, web page pushing. Through page pushing the librarian can send a static web page (an online screen shot) from the library's browser to the user's browser. Co-browsing engages both the librarian and the user simultaneously in the navigation process. It allows both the librarian and the user to control navigation of web pages and online databases. Any activity performed by the librarian in the co-browse window is seen by the user, and anything done by the user is seen by the librarian. IM/chat reference offered using a software package with a co-browsing feature has great potential for teaching information literacy (Roesch, 2006, p.5).



Figure 2.2: Online Chat Page of Gateshead public libraries, UK (adopted from Berube, 2003)

2.3.3.2.3 Voice over Internet Protocol

Voice over Internet Protocol (VoIP) is a technology that helps to transfer voice and other data simultaneously via the standard Internet protocol. Besides having hardware equipment, both users require microphones and speakers installed on the PCs in order to communicate with each other. It has become a common medium of communication among people nowadays.

2.3.3.2.4 Video-conferencing or Web-cam Reference

Videoconferencing eliminates communication problems associated with text-based services, as it includes a visual element. Through videoconferencing both text and speech can be used for a reference transaction. A window appears on the computer screen through which the librarian and the user can see each other, and conduct a face-to-face interview. It also allows pushing web or electronic sources through another window. Videoconferencing helps to provide distance education, research and reference services (Berube, 2003).

2.3.3.3 Collaborative Digital Reference Services

In addition to the above two forms of DRS, there is another form called, 'Collaborative Digital Reference Service (CDRS)' which involves collaboration between two or more libraries to offer DRS using any of the above asynchronous and synchronous tools. This is further explained in section 2.3.5.

2.3.4 Digital Reference Services in Academic Libraries

In order to fulfill the reference and information needs of users in a digital environment, many academic libraries across the globe have designed and developed DRS. Tenopir (2001, p. 38) found that 99% of the ARL member libraries, included in her study, provided e-mail reference, while 29% libraries offered real-time DRS. She noted that owing to the introduction of DRS there was a decrease in the total number of reference questions asked at the physical reference desk in 84% of the libraries. However, in-person reference was still used the most in the libraries.

Tenopir and Ennis (2002) conducted four surveys of ARL member libraries over a decade (in 1991, 1995, 1997 and 2000) in order to explore the changes and developments that had occurred in academic library reference services due to emerging technologies, and found that these libraries had adopted digital resources and services at an increasingly accelerated rate due to the introduction of the Internet and its associated technologies. They noted that digital resources had brought about changes in the physical environment of the reference department, in the type and range of reference sources available, and in the attitudes and expectations of both reference staff and users. The reference librarians surveyed were of the view that due to changes in the reference environment they had been able to provide better services to users. The study of Dee (2005) revealed that 80 out of 132 academic health sciences libraries in the USA offered email reference, while 36 libraries provided chat reference. The average number of reference questions received via e-mail by the libraries was 30 per month. Mu et al. (2011) carried out a study to investigate the status of DRS in academic libraries in the USA, and analysed the techniques adopted by these libraries to market their services through their

websites. Their study revealed that 85% of the libraries, included in the study, offered synchronous DRS using chat technology, 13% libraries provided asynchronous DRS via e-mail, while 2% libraries had not developed the service. They stressed the need to bridge the gap between users and the DRS by improving service accessibility. In order to improve service accessibility they suggested several techniques, which included creating a user-friendly name along with an image for the service, using large size text for the service name on the library websites, placing the service link on a visible spot on the library homepages.

Chowdhury and Margariti (2004) analysed DRS offered by three academic libraries, namely Glasgow University Library, the University of Strathclyde Library and Glasgow Caledonian University Library, and two other libraries in Scotland, the Mitchell Library in Glasgow and the National Library of Scotland in Edinburgh. They discovered that these libraries provided asynchronous DRS via e-mail, and were planning to start synchronous DRS using chat technology in order to improve their level of interaction with users at the time of the study. They observed that the majority of the queries handled by the libraries were relatively low-level rather than concerning particular knowledge domains. Barry et al. (2010) conducted a study to explore the status of synchronous DRS (chat reference) in UK academic libraries and found that 25% of the libraries included in their study had developed the service, while 54% of the libraries were considering starting the service. They also analysed various software products that were used by the UK academic libraries for the provision of chat reference services.

Academic libraries in developing countries have also started to embrace new technologies to redesign and improve their reference services in order to fulfil users' information needs in the web environment. Ahmad (2002) undertook a survey of seven university libraries in the Arabian Gulf in order to investigate types of web-based services offered by these libraries, and found that all the seven libraries had Web OPACs, three libraries provided links to search engines (both English and Arabic), while three academic libraries offered web forms for book recommendations and interlibrary loan (ILL) . The study of

Ramos and Abrigo (2012, pp.11-12) revealed that 22 out of 356 academic libraries in the Philippines had developed DRS. These libraries had employed both asynchronous and synchronous tools including web form, FAQs, instant messaging, and VoIP to offer the service. Wang et al. (2004) conducted a study of 95 university libraries in China and reported that 81 (90%) academic libraries offered DRS to users.

Maharana and Panda (2005) undertook a study to investigate the status of DRS in selected academic libraries in India (7 Indian Institutes of Technology and 6 Indian Institutes of Management). Their study revealed that 7 libraries had developed e-mail reference systems. Six libraries had employed videoconferencing to offer reference services, while three libraries offered chat reference. They observed that although these libraries had made a remarkable development in the automation and electronic access to information, they were far behind similar institutions in developed countries in introducing a standardised DRS. A study conducted by Singh (2012) to explore the status of DRS in four selected university libraries in India, revealed that three out of four university libraries had developed DRS. Of the three academic libraries, all the libraries offered asynchronous DRS via e-mail, while only one library had developed a synchronous digital reference system using chat technology. In order to improve the quality of DRS offered by these libraries, he called upon the library administrators to follow the RUSA and IFLA digital reference guidelines, and to develop techniques to assess their services.

Kadir Wan Dollah and Singh (2010) carried out a study to determine the effectiveness of DRS in four selected Malaysian academic libraries. They discovered that 19.5% of the users used e-mail reference, 28.2% web forms, and 4.9% chat reference to ask queries. The majority of the users (54.4%) regarded DRS offered by these libraries as of high quality. Despite the introduction of DRS in these libraries, the majority of users (56%) preferred face-to-face reference.

The study of Sekyere (2011), conducted to explore the status of DRS in academic libraries in ten West African countries, showed that the DRS was at a

developing stage in these libraries. The study revealed that only eleven out of sixty academic libraries (18%) had developed the DRS. Of the eleven libraries, ten libraries offered asynchronous DRS via e-mail, while only one library had implemented synchronous DRS by employing IM/chat. The researcher called upon academic librarians to improve their knowledge and skills in Web technologies in order to design and implement services that would meet changing needs of library users.

2.3.5 Digital Reference Collaboration

Digital reference collaboration is where two or more libraries work together and share their resources (human and material) to offer DRS to users at participating institutions. Factors, such as high cost and staffing led libraries to form collaboration in DRS. Most collaborative digital reference services operate on a 24/7 basis. Collaborative digital reference helps to share workload, provides access to the knowledge of several librarians, broadens the subject range and improves the quality of service (Roesch, 2006). Libraries started to build consortia in the late 1990s. There are a number of local, national, and international collaborative projects for the provision of DRS. The Metropolitan Cooperative Library System (MCLS), one of the first consortia consisting of public and academic libraries was launched in Southern California. In 1999, the Library of Congress (LC) started the Collaborative Digital Reference Service (CDRS), which initially consisted of 16 member libraries. LC and the Online Computer Library Centre (OCLC) developed a partnership in 2001 and launched QuestionPoint (a cooperative DRS that evolved from CDRS), which had more than 300 member libraries by 2003. At present, it has more than 1500 members all over the world (QuestionPoint, 2013; Kresh, 2003, pp.21-22). The National Library of Canada in collaboration with the community of Canadian libraries and research institutions started Virtual Reference Canada, a bilingual web-based reference service, in January 2003. In North America, the Brisbane City Council Library Service, Queensland Australia and Richland County Public Library, South Carolina started 24/7 live service named 'Answers Now' in November 2002 (Kresh, 2003,pp.21-22). A Danish CDRS project

'Biblioteksvagten' was launched in 1999. It has more than 60 members including academic and public libraries (Biblioteksvagten, n d).

In the UK, Ask a Librarian (a collaborative DRS of public libraries) was launched in 1997. It is a web form-based service that is available 24 hours a day, 365 days a year. Its average time to respond to a query is two working days. It may be considered the oldest national online enquiry service, offered by public librarians, in the world. Its members include 80 public libraries in the UK. It provides service to all types of users from university professors to students, and business men to family members (Ask-A-Librarian, 2013; Berube, 2004, pp.29-41). In 2005, the People's Network launched 'Enquire', a 24/7 chat reference service, through the collaboration of England's public libraries. It was funded by Big Lottery Fund and managed by Museums, Libraries and Archives Council (MLA), and administered by Co-East. Initially, it was staffed by English Public Libraries and OCLC International Network. Its software and support were provided by the OCLC chat reference QuestionPoint. After a trial period of 18 months, OCLC assumed full responsibility for management and operation of Enquire from the 1st November, 2006 and started merging it more fully with the wider community of QuestionPoint. At the beginning, Enquire had 97 member libraries but this number reduced to 86 in 2007. Enquire formed a partnership with Yahoo! Answers and became a knowledge partner on the Yahoo! Answers service at the beginning of 2008 (Enquire n. d.; Kirkland, 2008).

2.3.6 Digital Reference Guidelines

Implementation and management of DRS require a set of well-developed and maintained guidelines. With the development of DRS, library organisations have developed guidelines for DRS. These guidelines deal with various important aspects of DRS, and provide direction and recommendations for effective implementation and management of the service. Some of the most important and well-known guidelines include:

- IFLA Digital Reference Guidelines (IFLA, 2008)

- RUSA Guidelines for Implementing and Maintaining Virtual Reference Services (RUSA, 2010)
- RUSA Guidelines for Behavioral Performance of Reference and Information Service Providers (RUSA, 2013)

Chapter 3: Research Background

3.1 Introduction

This chapter presents background information related to the current study. It starts by giving a brief account of Pakistan, its education system and higher education. Next, it discusses the development of higher education institutions in Pakistan. Then, a discussion on the development of Pakistani academic libraries, their organisational structure and services is presented. After that, the chapter discusses the development of ICT and electronic services including DRS in Pakistani academic libraries, and the problems faced by the Pakistani academic libraries. Finally, it presents an overview of LIS education in Pakistan.

3.2 Pakistan-Country Profile

Pakistan, officially known as the Islamic Republic of Pakistan, came into existence on 14 August 1947 after partition of the Indian sub-continent by the British rulers. Pakistan is a developing country located in South Asia. It is bound to the west by Iran, to the north by Afghanistan, to the northeast by China, to the east and southeast by India, and to the south by the Arabian Sea. The total area of Pakistan is 796,095 square kilometers, which consist of a

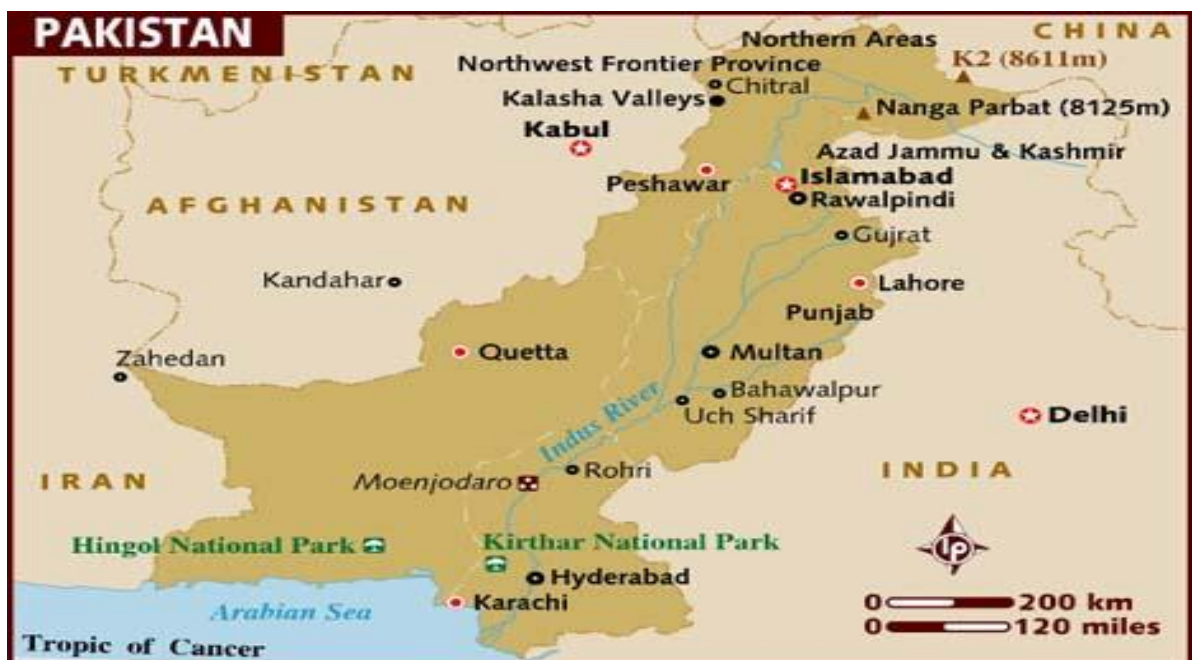


Figure 3.1: Map of Pakistan (Lonely Planet, 2013)

wide variety of landscapes including arid deserts, fertile plains, green valleys and stark mountains. Pakistan is the sixth largest country in terms of population in the world with a population of 196,174,380 (2014 est.). Its annual population growth rate is 1.49% (2014 est.). After Indonesia it is the second most populous Muslim country in the world. About seventy percent of its population lives in rural areas. Urdu is the national language of Pakistan and it is used as a medium of instruction in secondary schools in the public sector. Various regional languages are also spoken in different regions of the country. English continues to be used as the official language of Pakistan. English is also used as the language of instruction in private sector schools and at the higher levels of education, business and commerce. Pakistan's literacy rate was 54.9% in 2009. The main source of economy of Pakistan is agriculture. Pakistan is considered one of the largest producers of raw cotton which is the main source to drive the local textile industry-the main industry of the country. The GDP growth rate was 3.6 percent in 2013. The GDP composition by sector in 2013 was 25.3 percent from agriculture, 21.6 percent from industry and 53.1 percent from services. The Rupee is the currency of Pakistan (Geographia, 2005; Central Intelligence Agency, 2014; and Mahmood, Hameed and Haider, 2005, p.131).

Pakistan is a federation of four provinces: Punjab, Sindh, Khyber-Pakhtoonkhwa (earlier known as North-West Frontier Province) and Balochistan. Each province has a parliamentary system and is made up of districts. Islamabad, the capital of Pakistan, is a separate federal district. Other territories which are directly administered by the Federal Government are Azad Jammu and Kashmir, and Gilgit. The constitution of Pakistan and other agreements define and clarify the division of responsibilities between the provinces and the centre (Mahmood, Hameed and Haider, 2005, p.131).

3.3 Education System in Pakistan

Education is a basic need of every individual in every society. A better education system brings about social, economic, scientific and technological developments in a country. Isani (2001, p.5) observes that "education is a major

investment for economic and social development. Investment in education is considered as investment in human capital, this increases labour productivity, furthers technological innovation and produces a rate of return markedly higher than that of physical capital". The development of human resources depends upon the quality of education imparted to the citizens in a country.

In Pakistan, education is overseen both by the federal government and the provincial governments. The education system is organised into five levels: primary (grades one through five); middle (grades six through eight); high (grades nine and ten, leading to matriculation or Secondary School Certificate); intermediate (grades eleven and twelve, leading to an F.A. diploma in arts or F.S. science or Higher Secondary Certificate); and university programmes leading to undergraduate and postgraduate degrees. Preparatory classes (*kachi*, or nursery) were formally included into the system in 1988 with the Seventh Five-Year Plan (Blood, 1994). Education is provided through both the public and private sectors in Pakistan. The education system of Pakistan consisted of 270,825 institutions, and provided education to 40,926,661 students with the help of 1,507,100 teachers in the year 2010-2011. It included 194,151 public institutions and 76,674 private institutions. The public sector institutions served 26.63 million students to complete their education, while the remaining 13.96 million students were in the private sector institutions (AEPAM, 2011). Different schools and colleges, both in the public and private sectors, provide education up to the intermediate level. These schools and colleges are supervised by the Federal Ministry of Education at central level and by the Education Departments at provincial levels. Higher education (undergraduate and postgraduate levels) is imparted through different universities/degree awarding institutions (DAIs) and their affiliated colleges in the country. The following section describes higher education in Pakistan.

3.3.1 Higher Education in Pakistan

Higher education plays a vital role in the progress and development of a society. It helps in building human capabilities and accelerates economic growth of a society. Isani (2001, p.1) defines higher education as "any of the various types of education given in post-secondary institutions of learning, and usually

affording, at the end of a course of study, a named degree, diploma or certificate of higher studies". He points out that not only universities and colleges are called higher educational institutions, but various professional schools that impart professional education in such fields as medical science, technology, law, business management, art and music are also included in institutions of higher education. The main objective of institutions of higher education is to equip individuals with advanced knowledge and skills, and to prepare them to take positions of responsibility in different organisations and to work in different professions.

In Pakistan, universities, DAIs, and their affiliated colleges (both in the public and private sectors) provide higher education. The Higher Education Commission (HEC-formerly known as University Grants Commission (UGC)), an autonomous apex body, is responsible for controlling and regulating higher education in the country. The HEC is entrusted with the tasks of carrying out evaluation, improvement and promotion of higher education, undertaking research and development, formulating policies and guidelines for higher education institutions, designing curriculum for various subjects, conducting training courses for teachers and setting up standards and conditions under which institutions may be established and operated. The HEC supervises all degree-granted universities and institutions both in the public and private sectors. The funds of all the universities and DAIs are also allocated by the HEC. Although, the HEC funds the universities and DAIs in the public sector, it has recently started providing limited funds to private sector institutions for research and development. Affiliated colleges are supervised and funded by the Federal Ministry of Education at centre level and by the Education Departments at provincial levels. These colleges follow the curricula of the universities to which they are affiliated (Higher Education Commission, 2012a).

With the conversion of the UGC into the HEC in 2002, the higher education sector has made remarkable development in Pakistan. The HEC was given an enhanced and broadened mandate to evaluate and improve higher education, and increased powers and financial resources by the government to fulfill its mandate. Since its inception, the HEC has revolutionised the higher education

sector in Pakistan. A number of institutions have been upgraded to universities or DAIs, and new universities have been established in the country. In order to improve higher education and promote research culture in higher education institutions, the HEC has taken a number of initiatives. For example, the HEC provided overseas scholarships for PhD to existing faculty members to improve their qualifications; engaged qualified faculty members under the Foreign Faculty Hiring and Tenure Track system of appointments; provided research grants; offered travel grants for teachers and research students to present their research papers in international conferences; provided funds for organising national and international conferences, and seminars in the country; provided funds for a number of new development projects, and for improving the existing infrastructure and facilities in the higher education institutions of the country. The HEC also offered a number of foreign scholarships for PhD and post doctoral fellowship, and local PhD scholarships to competent students on the basis of merit in order to improve the manpower of the higher education sector in the country (Rafiq and Ameen, 2012, p.119).

Since its establishment, the HEC has arranged training for 3,726 teachers of different universities in the country. In order to promote research and improve faculty, 3,237 scholars were awarded local/indigenous scholarships for undertaking PhD studies in HEC recognised universities of the country and 2,600 scholars were sent abroad for studies under PhD Scholarship Programme till 2007-08. A total of 69 scholars went abroad for higher studies under the Cultural Exchange Programme in the year 2007-08. Moreover, 366 students were sent for undergraduate medical studies by the HEC in collaboration with the Cuban Government in 2006-07. Keeping in view the importance of higher education, 17 new universities have been established in areas where higher education opportunities were not available. 23 new disciplines have been introduced in different universities. Furthermore, 11 foreign institutions have started functioning in Pakistan through franchising/collaborative arrangements with national higher education institutions. The government has also planned to set up four Universities of Engineering, Science and Technology in Pakistan (UESTP) in collaboration with Germany, Austria, Italy and China, which will cost a total of 164.869 billion

rupees. 20 Central Research Laboratories have also been set up to facilitate research in the main universities of the country (Aziz, Khan and Aziz, 2008; Higher Education Commission, 2011a).

3.3.1.1 Higher Education Institutions in Pakistan

Akhtar (2007, p.373) states that “the reconstruction and prosperity of nations depend upon the number of educated people. It is the reason that at all stages around the world, education enjoys top priority. University education, which is the source of the production of intelligent and capable minds to shoulder the responsibilities of national reconstruction, continues to receive great attention and emphasis”. Universities play an important role in socio-economic development of a country. They help to build human capabilities and develop human resources compatible with social and economic requirements of a country. All the developed nations owe their progress and development to research and studies conducted in their universities.

The development of universities in Pakistan started during the period of the British rule in South Asia when India, Pakistan and Bangladesh formed one geographic entity. In this region, the foundation of modern, liberal and technological universities was laid by the British rulers who established University of Calcutta, University of Bombay and University of Madras in 1857 (Ameen, 2006, p.155). Haider (2004, p.230) notes that within the regions that now form Pakistan, the first such institution of higher education, namely the University of the Punjab, was established in 1882 at Lahore. The other university, University of Sindh, Jamshoro was in the process of organisation when Pakistan came into existence in 1947 after partition of the Indian sub-continent. So Pakistan, at the time of its creation, had two universities.

With the creation of Pakistan, demand for a large number of educated persons in various fields arose to run affairs of the newly established country. In order to achieve this objective, the first university to be established after the creation of Pakistan was the University of Peshawar (1950) which was followed by the University of Karachi (1951). After a long period of ten years, two professional

colleges namely 'Agriculture College, Faisalabad' and 'Engineering College, Lahore' were upgraded to 'the Agriculture University, Faisalabad' and 'the University of Engineering and Technology, Lahore' respectively in 1961. When the capital of Pakistan shifted to Islamabad, another university, the University of Islamabad (now known as Quaid-e-Azam University) came into existence for imparting postgraduate education in physical sciences and social sciences in the mid-1960s. During the 1970s, seven more universities were established in the country and in this way the total number of universities became fourteen in all. By 1985, the number of universities existing in the country had increased to twenty one, out of which two were in the private sector (Haider, 2004, p.230). With the establishment of Agha Khan University at Karachi in 1983 and Lahore University of Management Sciences (LUMS) in 1985, the private sector started to make its significant contribution in the higher education of the country. By 1998, a total of thirty five universities, twenty five in the public sector and ten in the private sector, had been established in the country. Moreover, three schools were also declared degree awarding institutions in the private sector (Ameen, 2006, p.156).

With the conversion of the UGC into the HEC in 2002, the pace of development of higher education institutions in the country increased, and a number of existing institutions were upgraded to university or degree awarding status. A number of new universities/DAIs were also established. The universities and DAIs are chartered and founded as autonomous organisations by federal government at central level, and by provincial governments at provincial levels in Pakistan. In Azad Jammu and Kashmir (a separate region included in Pakistan), higher education institutions are also chartered by its government. The HEC is responsible for controlling and supervising all the universities and DAIs, both in the public and private sectors, in the country. There are, currently, 158 recognised universities and DAIs in Pakistan, of which 89 belong to the public sector, whereas 69 are in the private sector (Higher Education Commission, 2014) (Table 3.1).

Table 3.1: HEC recognised universities/degree awarding institutions in Pakistan (Higher Education Commission, 2014)

Chartering authority	Public sector	Private sector	Total
Govt. of Pakistan (Federal Government)	24	6	30
Govt. of Punjab	20	22	42
Govt. of Sindh	16	28	44
Govt. of Khyber Pakhtoonkhwa	19	10	29
Govt. of Balochistan	6	1	7
Govt. of Azad Jammu & Kashmir	4	2	6
Total	89	69	158

The universities/DAIs can be classified into two main groups, i.e. general and professional. General universities/DAIs offer higher education in arts, commerce or science, whereas professional universities/DAIs offer professional courses in agriculture/veterinary, health sciences, engineering, business/IT and art/design. With the exception of one university i.e. Quaid-i-Azam University, Islamabad, all the general universities are both teaching and affiliating institutions. The universities extend affiliation to degree colleges to impart higher education in arts, science and professional fields. There were 1,384 degree colleges affiliated with universities and DAIs in the country, with 40,191 teachers and 0.50 million students in the year 2011-12. Whereas, the number of universities and DAIs, both in the public and private sectors, in the country was 139 in the year 2011-12. The figures of teachers and students in these universities and DAIs were 70,053 and 1.32 million respectively in the year 2011-12. The students' enrolment increased in these institutions with the passage of time. An enrolment of 0.56 million students was expected in affiliated degree colleges and 1.60 million students in universities and DAIs of the country in the year 2012-13 (Ministry of Finance, 2012b, p. 134).

3.3.1.2 Programmes of Study offered by Higher Education Institutions in Pakistan

Universities and DAIs in Pakistan offer the following programmes of study in general and professional education:

- **Undergraduate courses:** The following two types of Bachelor's courses are offered in higher education institutions of Pakistan:

- a) Bachelor's degree (Pass) is awarded after two years of study in arts, commerce or science subjects.
- b) Bachelor's degree (Honours) in arts, commerce, science, agriculture, engineering, pharmacy, dentistry, veterinary medicine consists of four years of study, while a Bachelor's degree (Honours) in architecture and medicine requires five years of study.

Entry into both of the above mentioned programmes requires HSC (Higher Secondary Certificate).

- **Postgraduate courses:** A Master's degree in arts, commerce or science comprises two years of study after the Pass Bachelor's degree and one year of study after the Honours Bachelor's degree, while the Master's degree in business administration (MBA) requires two years of study and is taken after any Bachelor's degree. A postgraduate diploma is awarded after one year of study following a Bachelor's degree in a related subject. The Bachelor's degree in Law (LLB) is a three-year postgraduate course followed by any Bachelor's degree.

- **Research courses:** Master of Philosophy (M.Phil) is taken after a Master's degree in a relevant subject. The minimum duration of the Master of Philosophy is of two years. Doctor of Philosophy (Ph.D) is offered by research as well as by course work cum research. Some universities also offer degrees of Doctor of Literature (D. Lit.), Doctor of Science (D.Sc.) and Doctor of Law.

3.3.1.3 University Libraries in Pakistan

The role that a university library plays to support teaching and research programmes of a university can never be overemphasised. In fact, the success of teaching and research programmes of a university largely depends upon the resources and services of its library. Akhtar (2007, p. 373) notes that “the quality of education and research depends to a large extent upon the quality of library services. University libraries today play a very important role in making university programmes successful and meaningful”.

As mentioned above, the foundation of modern universities was laid by the British rulers in the Indian subcontinent in the mid-19th century. Akhtar (2007, p.374) states that at their outset, these universities acted merely as affiliating and examining bodies. They were not involved in teaching and research activities until 1904. The Indian Universities Act of 1904 made remarkable changes in the functions and responsibilities of the universities. Thereafter, the role of these universities expanded from affiliating and examining bodies to teaching and research institutions. The promulgation of the Act required universities to impart instruction to the students, build and maintain university libraries and laboratories, and appoint lecturers and professors for the universities.

Before the creation of Pakistan only one university, the University of the Punjab, was established in this part of the sub-continent in 1882. After the pronouncement of the Indian Universities Act 1904, the first university library was set up in Lahore at the University of the Punjab in 1908. The head of this library was an honorary librarian. Modern library services started in the Pakistani territories in 1915 when Asa Don Dickinson, an American librarian and student of Melvil Dewey, arrived at the University of the Punjab. The objective of his visit to this university was to organise the university library and to teach modern library methods to the librarians of this region (Akhtar, 2007, pp.374-375; Haider, 2004, p.229).

The second university library was established at the University of Sindh, which was in the process of its organisation at the time of Pakistan's birth. Mr. Abdul Moid served as the first librarian of the University of Sindh library from 1948 to 1952. The University of Peshawar library came into existence one year after the establishment of the university in 1951. Maulana Abdul Sabuh Qasmi, who later obtained an M.L.Sc degree from Western Reserve University, Ohio, USA in 1956, assumed the charge of this university library. Similarly, the University of Karachi library was also organised one year after the creation of the university in 1952. Later on, the majority of the university libraries in Pakistan were established in the same year as the universities (Akhtar, 2007, p.374).

University libraries in Pakistan were affected by a number of factors in the 1970s. In this regard, Haider (1986, p. 196) argues that "during the 1970s the university libraries as a group suffered most for a wide variety of reasons". He observes that the main factors that caused deterioration of university library services during this period included expansion of higher education without any planning, launching of the semester system in universities, democratic trends in university administration, budget constraints, politics in the campuses, students' pressure for involvement in policy making of universities and migration of competent LIS professionals to the OPEC countries. However, the UGC took some steps to make improvement in the deteriorating condition of the university libraries in the late 1970s. These steps included: the organisation of a national workshop for university librarians in 1980; establishment of a Standing Committee on University Libraries (1980); and conducting an in-service training programme in collaboration with the British Council for university library staff. D.J. Foskett of London University also prepared a report for the improvement of Pakistani university libraries in 1981 (Haider, 1986, pp. 196-197).

Khurshid (1987, p. 67) notes that the staff of Pakistani university libraries were trained in two phases under the training programme launched by the UGC in cooperation with the British Council in 1980. In the first phase, the library staff attended annual national workshops organised in the country. In the second phase, LIS professionals demonstrating good progress at the annual workshops were selected and sent to the then Department of Library and Information

Studies, Loughborough University, UK for an internship. Under this programme, 59 librarians attended the three national workshops and 11 librarians received professional training at Loughborough University, UK.

In a survey of library resources in Pakistan, Khurshid (1990) found that the total number of books held by 22 university libraries in Pakistan was 2,899,400 in 1989-the student enrolment in these universities was 65,300 in 1987-88. Hence, the university libraries provided about 44 volumes per student in 1989. In another study, Khurshid (1993, p.645) discovered that more than 140 libraries existed in 23 Pakistani universities in 1989, which held almost 2,900,000 volumes, more than a fifth of all books in Pakistani libraries. He observed that the university library collection rose at more than 60,000 books a year in the 1980s, which was in proportion to the students' growth in the universities. As regards the number of books held by different university libraries at that time, he stated:

“The main central university collections are at the University of Punjab Library (opened 1906; 769,000 volumes); the Mahmud Husain Library, Karachi (founded 1952; 255,000 volumes); Peshawar University (1951; 200,000 volumes); Quaid-e-Azam University (1965; 150,000 volumes); and Sind University (opened 1949; 137, 8000 volumes). The Lahore University of Management Sciences (8,000 volumes) and Shah Abdul Latif University, Khairpur (19,200 volumes) opened in 1985; the Hamdard University (80,000) volumes opened at Madinat al-Hikmat in 1989” (p. 645).

Khalid, Mahmood and Willson (1997, pp. 331-332) have observed that most of the Pakistani university libraries use Anglo American Cataloguing Rules (AACR) for cataloguing the books, and Dewey Decimal Classification Scheme for classifying the material. Haider (2004, p. 231) has noted that the proliferation of universities in Pakistan tarnished the concept of the library as an educational and research agency in 1990s. The libraries of most of the newly established universities held a small number of books and a few magazines in their collections. Keeping in view the deteriorating condition of the new academic libraries, the HEC set up new criteria for establishment of new universities, both in the public and private sectors. Under the new criteria no university would be

allowed to be established until its library has subscription to at least fifteen current journals of international repute, access to e-journals and at least 1500 books from main international publishers in relevant fields (Higher Education Commission, 2007, p. 69).

3.3.1.3.1 Organisational Structure of University Libraries of Pakistan

All universities and DAIs in Pakistan have libraries which provide services to the students and faculty. The organisational structure of university libraries varies from university to university. Haider (2004, p. 231) has mentioned the following three main organisational models of the university libraries in Pakistan:

- **A strong central library:** In this type of organisation there is only one central library which contains all reading materials and provides services to all students and faculty of the university. All reading materials are acquired, accessioned and processed by the central library. The central library is further divided into administrative units/sections, such as acquisition, technical processing, circulation, reference. This type of organisational model exists at professional universities, e.g., Agricultural University, Faisalabad; University of Engineering and Technology, Lahore; Mehran University of Science and Technology, Jamshoro.
- **Decentralised library service:** Under this organisational model each department/constituent college of the university has its own library which provides services to the students and faculty of the concerned department. There is no coordination among different departmental libraries. Each department is responsible to manage its own library. The reading material is procured, processed and maintained by the departmental libraries. Apart from the departmental libraries, there is also a central library which has no link with the departmental libraries under this model. The central library holds and maintains its own collection and serves the whole university community. Ahmad (1984, p.13) has observed that the institutional structure and physical layout of the University of the Punjab, one of the largest universities of the country, require a decentralised and uncoordinated pattern of library services.

All the teaching departments have their own departmental libraries. Another university, Bahauddin Zakariya University, Multan has also set up its library services on the pattern of the University of the Punjab. There is one central library and departmental libraries which are administered by the concerned departments without any coordination with the central library in this university.

- **A central library along with seminar/departmental libraries:** This organisational pattern is found in most of the university libraries in Pakistan. Under this arrangement, the central library is responsible for all the library operations and services in order to meet the teaching and research requirements of the whole university community. However, the central library provides a specific number of books on loan to various teaching departments on request in order to fulfill the immediate reading requirements of the students and teachers. This pattern is followed by a number of universities, e.g., University of Karachi, University of Sindh (Haider, 2004. pp.231-232).

Pakistani university libraries, both in the public and private sectors, employ professional, para-professional and non-professional staff in order to perform various tasks and duties. Non-professional staff working in the university libraries include library attendants, book binders, messengers, security guards, janitors, peons, cleaners and sweepers. Some large university libraries also appoint IT professionals to maintain their ICT infrastructure (Warraich and Ameen, 2011b; Mirza and Mahmood, 2013). In most of the university libraries, the chief librarian is head of the library, who is responsible for internal management of the library. The authority regarding financial and administrative matters of the library lies in the hierarchy of university syndicate, academic council and library committee. The university library has a library committee comprising chief librarian (secretary) and nominees of university syndicate, academic council, faculty members and administration. The library committee is usually considered as an advisory body which gives its recommendations regarding different library matters, which are implemented after approval of the university syndicate. Members of the library committee are nominated by the vice chancellor on recommendations of the chief librarian.

3.3.1.3.2 Services Provided by University Libraries of Pakistan

University libraries in Pakistan provide a variety of services to students and faculty in order to meet their instructional and research needs. Akhtar (2007, p.377) and Haider (2004, pp. 232-233) have mentioned various services provided by the majority of the Pakistani university libraries. These services include: bibliographic and reader services; reference services; microfilming of rare materials; lending services; photocopying services; maintenance of clipping files and pamphlets files; organisation of seminars, lectures and book exhibitions; publication of select and special bibliographies; interlibrary loan, access to electronic resources, etc. Khan and Ahmad (2007) have highlighted various library services, such as indexing, abstracting, circulation, reference and information services, etc offered by the Pakistani university libraries. The following section describes the reference services provided by the university libraries in Pakistan.

3.3.1.3.2.1 Reference Services in University Libraries of Pakistan

Lopes (1992, p.39) has observed that the setting up of reference services and reference departments in libraries must be viewed as an important factor in the development of effective libraries and information systems in developing countries. Among the Pakistani university libraries, the Karachi University Library was the first to establish a reference section in 1964. In this regard, a plan for development of the reference section at the University of Karachi was prepared by a committee comprising senior professional staff. The salient features of this plan included: (1) the reference section would contain only reference books; (2) tracing out and collecting reference books scattered in the central library and departmental libraries of the university; (3) preparation of a list of important reference sources to be acquired by the acquisition department; and (4) selection of two professional staff members and making arrangements for their training for reference work. The students of Department of Library and Information Science of this university, then the country's only library school

offering a Master's degree in Library and Information Science, used this reference section as a laboratory. Hence, this reference section served as a model for graduating LIS professionals, which in turn, impacted the teaching and practice of reference service throughout the country (Haider, 2008, pp.85-86).

Haider (2008, p.86) has observed that the services offered by the reference departments at Pakistani university libraries include: (1) to familiarise new users with rules, regulations, and services of the library; (2) to obtain books on interlibrary loan from other libraries; (3) to provide bibliographical assistance to the users; and (4) to answer questions for factual information. Ahmad (1984, p.49) has noted that the reference services provided by Pakistani university libraries include assistance in using catalogues, periodical indexes, reference sources, such as encyclopaedias, abstracts, etc. Haider (2008, p.85) has observed that a separate reference section exists in all public sector university libraries in Pakistan. In a survey of the public sector university libraries located in the federal capital of Islamabad and the Khyber Pakhtookhwa province, Pakistan, Jan and Sheikh (2011 p.5) found that all the libraries, included in their study, provided reference services to users. Khan and Bhatti (2012, p.8) discovered that the reference service was the second most common service offered by departmental libraries at the University of Peshawar, Pakistan. Rehman and Mahmood (2010) analysed existing reference sources and services of university libraries, both in the public and private sectors, located in Lahore (the second largest city of Pakistan), and discovered that all libraries had reference collections in print form, while the majority of the libraries contained reference collections in electronic form. They further observed that all the libraries offered information services, guidance and instruction to users. The majority of the libraries had a separate reference section, whereas 44% of the libraries had separate reference staff (including professional and para-professional reference staff). Their study further revealed that the majority of the libraries had no written reference service policy. Moreover, most of the libraries had neither formulated a collection development policy regarding reference collection nor had they allocated funds for reference collection. In order to

measure the quality of reference services, some of the libraries conducted users' surveys.

Rehman, Shafique and Mahmood (2011) conducted a survey to explore users' perception of, and satisfaction with, reference services in the public sector general university libraries of Punjab province, Pakistan, and found that although the respondents were overall satisfied with reference staff, collections, facilities and services provided by their libraries, they did not rank 'highly satisfied' to any component of reference services. Based on the findings of their study, they made a number of recommendations, such as provision of a good reference collection, staff and services, introduction of DRS, training of reference staff, launching of library instruction programmes mainly targeted at undergraduate students, proper training of students for reference services including the DRS at library schools in the country, in order to improve reference services in the university libraries in Pakistan. Khan (2006) also carried out a survey to explore users' perception of reference services at Peshawer University Library, Pakistan, and discovered that the reference librarian's attitude and users' awareness about the service played an important role in utilising the service by users in the library.

Most of the users are not familiar with library and its resources. They cannot use library services and resources efficiently. User education aims to teach users how to make the best possible use of library resources, services and facilities. It also includes formal and informal instruction (ODLIS, 2013), which is considered an important element of reference work (Cassell and Hireman, 2009, pp.6-7). Bhatti (2010) noted that the majority of the Pakistani university libraries, included in her study, offered user education on an informal basis, while 39.3% of the libraries organised user education programmes on a formal basis. User education programmes offered by the majority of the libraries included library orientation and basic bibliographic instruction. She viewed the lack of policy, unawareness of the importance of user education, scarcity of resources and the lack of cooperation between the university authorities and library management as the main obstacles which prevented the university libraries from providing user education on a formal basis. Mirza and Mahmood

(2012, pp.127-129) found that a number of students had attended information literacy sessions on electronic resources and services organised by different university libraries included in their study.

3.3.1.3.3 Resource Sharing among University Libraries of Pakistan

Libraries share their resources with one another for three main reasons: 1) to avoid duplication of effort involved in time consuming and laborious jobs; 2) to resolve financial issues; and 3) to provide users with access to services and resources beyond the limits and limitation of a library (Jaswal, 2005, p. 88). Haider (2003, pp.57-58) has observed that all types of libraries throughout the world are faced with three main challenges, i.e., the current information explosion, unprecedented increase in the amount of printed and electronic resources, and the ever-increasing information needs of users. Apart from these issues, all types of libraries, including academic libraries, in Pakistan are encountered with the lack of funds, paucity of information resources and the lack of bibliographical and physical accessibility to the existing information resources. In order to resolve these problems, facilitate various library operations and services, and promote use of resources and services, Haider (2003) has emphasised that Pakistani libraries including academic libraries should share their resources (i.e., people, processes, material, and money). He has observed that some projects for resource sharing and networking, i.e. 'the Lahore Business and Economics Libraries Networks (LABELNET)'-comprising libraries (including academic libraries) in the areas of public administration, business, administration, management and economics, 'the Pakistan Parliamentary Libraries Development Project (PPLDP)'-comprising libraries of six legislative bodies in the country, and 'the Management of Agriculture Research and Technology (MART) Library Strengthening Project'-comprising agricultural libraries in the country, were planned and launched in Pakistan in the past. But all these projects failed due to a number of reasons, such as an absence of proper planning, lack of competent manpower, limited application of ICT by participating libraries, and non-availability of standards.

In order to develop and promote resource sharing and networking projects among Pakistani libraries, Haider (2003, pp. 62-63) has suggested that: 1) the National Library of Pakistan and the Pakistan Library Association must play an important role in developing cooperation among libraries, and producing standards and cooperative tools, such as union catalogue and union list of serials; 2) library associations, library schools and leading LIS professionals in the country should persuade LIS professionals to acquire ICT skills and implement ICT in their libraries for fast storage and retrieval of information; 3) a task force comprising members of Pakistan Standard Institution, Pakistan Library Association, UGC, and the National Library of Pakistan should be constituted for the formulation of standards for various library operations, such as cataloguing, classification, subject headings, bibliographic description for exchanging bibliographic data; 4) small-scale schemes of resources sharing should be preferred over large-scale projects; and 5) subject and geographical limitation should be considered for establishing cooperative projects.

Ameen (2008) discovered that a small number of Pakistani university libraries, included in her study, were involved in a primitive level of interlibrary loan, whereas the majority of the libraries had no formal programme for collection sharing. She concluded that various technical, procedural, psychological, and behavioural barriers hampered the development of formal collection sharing programmes among these university libraries. To develop and promote formal collection sharing programmes among Pakistani university libraries, she suggested that: 1) library heads should take the initiative to engage in a formal collection sharing programme by analysing challenges and opportunities for collection sharing, and by exploring possible partners at local, national and international levels; 2) academic libraries should develop their Web OPACs on a priority basis so that they can share their resources with partner libraries easily; 3) workshops and seminars on collection sharing should be organised in the country for guidance and motivation of LIS professionals; and 4) the Pakistan Library Association should formulate rules and procedures for collection sharing among libraries at local and national levels.

Sharif (2006, pp105-116) observed that a number of academic libraries located in Lahore were engaged in resources sharing on an informal basis at local level in the absence of any formal arrangements. He stressed the need of resource sharing among different types of libraries, including academic libraries, in Pakistan on a formal basis, and proposed the following three models for resource sharing:

- **Model-1 (Inter-Type RS):** In this model, different types of libraries, irrespective of their scope, resources and users, can share their resources. For example, university libraries can share their resources with any or all types of libraries, i.e., college libraries, public libraries, special libraries, at local level.
- **Model 2 (Intra-Type RS):** In this model, a library is required to share its resources with another library of the same type. This model can facilitate resource sharing among specific types of libraries, e.g. among university libraries, among public libraries or among special libraries. Since level of participating libraries will be the same, this model can be adopted easily.
- **Model-3 (RS through consortium):** In this model, selected resources (both in printed and electronic form) can be housed at a central place and access to resources can be provided to all participating libraries. The example of HEC National Digital Library can be followed which provides all university libraries in the country with online access to a large number of e-books, e-journals and databases covering a wide range of disciplines (HEC-NDL, 2013).

In order to overcome problems caused by the information explosion, an unprecedented increase in the amount of printed and electronic resources, the increasing information needs of users, lack of funds, and dearth of information resources, Pakistani academic libraries need to develop cooperation and share their resources by initiating some projects of resource sharing and networking on a formal basis. In this way they can provide access to better and efficient services to users and, ensure their satisfaction.

3.3.1.3.4 Development of ICT in University Libraries of Pakistan

The history of the use of computers in libraries can be traced back to the 1950s and 1960s in the USA and Europe respectively (Mahmood, 1996, p. 36). In Pakistan, computers were first used by the Pakistan Scientific and Technological Information Centre (PASTIC) for producing the Union Catalogue of Scientific Periodicals in 1968. This centre also developed a users' profile of 100 scientists in order to provide a selective dissemination of information (SDI) service. Amongst Pakistani university libraries, the Central Library of Sindh Agriculture University, Tandojam was the first university library that started the use of computer technology in the mid-1980s. By early 1986, computerisation of Lahore University of Management Sciences (LUMS) had also been started. By the end of 1980s, some of the important libraries had been computerised and libraries of business and economic organisations at Lahore had established their network named 'Lahore Business and Economic Libraries Network (LABELNET)'. The National Agriculture Research Centre (NARC) introduced CD-ROM searching in 1989. At the beginning of the next decade, the library schools of the country took interest in modern technology and established computer laboratories in their respective departments. The curriculum taught at the library schools was thoroughly revised under the direction of the UGC and more courses on Information Science were incorporated in the curriculum (Haider, 1998, pp.56-58).

In 1991, a survey of 95 libraries including academic libraries, located in the federal capital of Pakistan, revealed that only 35 libraries had been provided with computers. The majority of these libraries were special libraries which had IBM PC compatibles. The software used in these libraries included CDS/ISIS, dBase III+, FOX-BASE, INMAGIC, LOTUS, and self-devised/in-house programmes. Computers were mostly used for performing functions, such as cataloguing and acquisition in these libraries. By 1998, a total of 125 libraries of all types had started the use of computers in Pakistan. The National Library of Pakistan had also started the automation process. These libraries used computers for different library operations and services including acquisition, cataloguing, indexing, periodical holding, e-mail, circulation, CAS, SDI and CD-

ROM searching. In order to develop technical skills and competency in LIS professionals some necessary steps were taken, which included: (1) organisation of computer training courses by library associations, library schools and research organisations; (2) holding of seminars and workshops on different aspects of information technology by library schools and library associations; (3) training of working librarians abroad with the cooperation of some international organisations; and (4) revision of LIS curricula for Bachelor's and Master's degree programmes with the purpose of including courses of information science (Haider, 1998; Mahmood, 1996).

Mahmood (1999) has presented a review of the key literature on the development of ICT in different types of libraries, including academic libraries, in Pakistan. He noted that international agencies made a significant contribution to the development of ICT in libraries in Pakistan. Of these organisations, the most important included the Asia Foundation, the International Development Research Centre of Canada, USAID and the Netherlands government. These agencies provided both funds and advisory services to libraries in Pakistan. During the 1990s, the Netherlands Library Development Project (NLDP) played an important role in introducing ICT into Pakistani libraries. The main activities of this project included supply of computer hardware to libraries, establishment of computer centres in the country, organisation of training courses on ICT for LIS professionals, development of library software and CD-ROM databases, provision of free consultancy to libraries, introduction of courses on ICT in the curriculum of Library and Information Science and retrospective conversion of bibliographic data of the country's main libraries. The NLDP, with the collaboration of the Pakistan Library Association, set up five computer centres in the federal and provincial capitals of the country. These computer centres played an important role in providing training in ICT to working librarians including academic librarians in the country. The NLDP also sent some working librarians to the Netherlands for advanced training in ICT (Mahmood, 1999, p.307).

The Internet was introduced in Pakistan by organisations like Sustainable Development Networking Programme (SDNP) and BrainNet in 1991. By early

1997, eight companies had started providing Internet services with about 10,000 connections in Pakistan. The number of Internet users grew from 70,000 in 1999 to 200,000 in the year 2000 (Saeed et al, 2000, pp. 155-157). Efforts are underway to connect different towns and cities of the country with the Internet. By the middle of 2008, 3,002 towns and cities in the country had been connected with the Internet (Ministry of Finance, 2012a). By the end of June 2012, there were 29,128,970 Internet users in Pakistan, with 15.3% penetration rate in the population (Internet World Stats 2013). The use of broadband services is also increasing in Pakistan. As of April, 2014, there were 3,633,051 broadband subscribers in the country (Pakistan Telecommunication Authority, 2013).

Libraries of all the public sector universities and DAIs in the country have been provided with Internet connectivity by the government (Mahmood, 2010). The private sector academic libraries have also been connected with the Internet by their parent institutions. With the introduction of the Internet, academic libraries in Pakistan started to perform various tasks through the Internet. Saeed et al, (2000, pp.155-157), found that Pakistani university libraries, included in their study, used the Internet to perform library functions, such as acquisition, interlibrary loan, collection development, reference services, document delivery service and SDI service. Mahmood (2010), and Butt, Qutab & Mahmood (2011) discovered that LIS professionals had started using the Internet extensively for performing library tasks in Pakistani academic libraries included in their studies. Students in higher education institutions of Pakistan have also started using the Internet to obtain their required information. The studies of Bhatti et al. (2011), Khan, Khan & Bhatti (2011), and Bashir, Mahmood & Shafique (2008) revealed that the use of the Internet by students of Pakistani universities, included in their studies, had increased significantly. The students mostly use the Internet to fulfill their information needs and to complete their academic work.

Academic libraries can employ mobile phone technology to deliver different electronic services including DRS through short message service (SMS). In Pakistan, the mobile phone technology has made remarkable development in recent years. The number of mobile phone subscribers in the country increased

by 45 percent in the last five years. By the end of May 2014, there were 139.2 million cellular phone subscribers in the country. Cellular phone teledensity of the country jumped to 71.4 percent in 2012-13 from 3.29 percent in 2003-04, while total teledensity (including fixed local loop, wireless local loop and mobile) reached 74.9 percent in 2012-13 (Pakistan Telecommunication Authority, 2013). The cellular phone network covers over 92 percent of the total land area of Pakistan. The number of cell sites grew by 5.8 percent during financial year 2012-13. At the end of March, 2014, there were 37,169 cell sites installed by all cellular phone operators in the country (Ministry of finance, 2012c, p. 207). University libraries can take advantage of the vast mobile phone network and the growing use of mobile phones among people in the country to deliver DRS efficiently. Users can also access and utilize the service through their mobile phones from anywhere.

Ramzan (2004, p. 276) mentioned the number of computers, different kinds of hardware devices and software available, and the level of their usage in academic libraries in Pakistan. He found that the majority of the libraries (77%), included in the study, had enough computers to perform different library functions. The study further revealed that more than half of the libraries had an Internet connection. A survey of 288 academic libraries, including affiliated college and university libraries in Pakistan, was conducted by Ramzan and Singh (2009) to explore the status of information technology applications in these libraries. Their study revealed that about 25% of the libraries had only one PC, 50% of the libraries had 2-10 PCs, 10% had 11-20 PCs, 9% had more than 20 PCs, while 5% libraries did not have any PC. As regards laptops, the study divulged that the majority of the libraries (90%) had no laptop. The study further revealed that 15% of libraries had developed their websites, 46% had internal OPACs, whereas 19% had Web OPACs. As regards the status of automation, the study showed that 8% libraries were fully automated, 36% were 75 percent automated, 32% were 50 percent automated, 11% were 25 percent automated, while 11% were without automation. Library software used by the majority of these libraries for automation included CDS/ISIS for Windows (CD ISIS/WINISIS), developed by United Nations Educational, Scientific, and Cultural Organisation (UNESCO), and Library Information Management System

(LIMS), developed by the Pakistan Library Automation Group. Of these libraries, the majority had an Internet connection (86%) and access to e-resources of the HEC National Digital Library (76%). The study also presented a brief account of the budget allocated for development and maintenance of ICT in these libraries during different periods of time. In another study, Jan and Sheikh (2011) found that half of the public sector university libraries located in the federal capital of Islamabad and the Khyber Pakhtoonkhwa province, included in their study, had been fully automated, while 33% had been partially automated. Most of these libraries used WINISIS and LIMS software for automation. Their study further revealed that the majority of the libraries had 1-15 computers, while two large libraries had more than 50 computers. All the libraries also had an Internet connection.

In order to provide voluntary support for developing, implementing and promoting automated library systems in the country, some young professionals from the fields of library and information science and computer science formed an organisation called 'the Pakistan Library Automation Group' in 2002. The group has designed and developed a library system, 'Library Information Management System (LIMS)' for library automation, and distributed it free of cost to a number of libraries in the country. The group has also provided training on LIMS software to LIS professionals. Sixty libraries including some large academic libraries have implemented the LIMS. The group has introduced a customised version of the open source software Koha under the name of 'PakLAG Koha' for automation of libraries in the country. The group has also introduced the first multilingual Web OPAC in Pakistan. It helps in searching library materials in English, Urdu (Pakistan's national language), and other regional languages through simple and advanced searching interfaces based on author, title, subject, classification number, publisher, and year of publication. The group also provides training in ICT to LIS professionals in the country, and free consultancy regarding selection of hardware, software, and retrospective conversion. Other main activities of the group include compilation of an online directory of LIS professionals in Pakistan, publication of an online LIS newsletter, developing a listserv for LIS professionals in Pakistan, setting up a virtual library, etc. The group has made a remarkable contribution to the

development and promotion of ICT in all types of libraries including academic libraries and the LIS profession in the country (Mahmood, Khan and Siddique, 2008; Pakistan Library Automation Group, 2013).

The HEC has invested huge resources to develop the ICT infrastructure in higher education institutions in Pakistan. The HEC, through the University Computerisation and Networking Programme, has provided funds to all public sector universities to establish an ICT infrastructure within their institution, including computer laboratories and Local Area Network (Higher Education Commission, 2011b). The revolutionary Pakistan Education and Research Network (PERN), launched in 2002, aims at interlinking all the public and private sector universities, DAIs and research organisations in Pakistan registered with the HEC. The network has evolved significantly and is offering valuable services, such as high-speed Internet, sharing of large size data among universities, video-conferencing, Voice-over-IP, and access to HEC-National Digital Library. At the time of its inception, it provided connectivity to 56 public and private sector universities and higher education institutions. Currently, 150 universities and institutions are connected through this network (Pakistan Education and Research Network, 2013).

Access to information resources is essential to undertake research and studies in institutions of higher learning. In order to provide researchers within public and private sector universities, and non-profit research and development organisations with online access to databases, e-journals and e-books covering a wide range of disciplines including science, technology, social sciences and humanities, the HEC has developed a National Digital Library (NDL). The NDL contains more than 30 databases, more than 24,000 e-journals of different disciplines and 45,000 e-books. The HEC launched this project with the collaboration of the UK based International Network for the Availability of Scientific Publications (INASP), for the implementation of their Programme for the Enhancement of Research Information (PERI). In order to access the resources of the NDL an institution has to register with the HEC (HEC-NDL, 2013; Warriach and Ameen, 2010a, p.109). The HEC has also developed the Pakistan Research Repository (PRR) which aims to maintain a digital archive of

PhD theses produced indigenously to promote the intellectual output of Pakistani institutions. It provides online access to PhD theses produced by the institutions of higher education in Pakistan (Pakistan Research Repository, n. d.). A number of university libraries in Pakistan have also started digitising their materials in order to provide online access to information resources (Rafiq and Ameen (2013).

3.3.1.3.5 DRS in University Libraries of Pakistan

With the development of ICT and introduction of the Internet, Pakistani university libraries, besides performing other library tasks, started to provide reference services through the internet. A survey of university libraries in Pakistan, conducted by Saeed et al. (2000), revealed that half of the university libraries included in the study used the Internet to provide reference services. A library website is considered a necessary adjunct for DRS as it is used to mediate reference queries. Qutab and Mahmood (2009) carried out a study of websites of 52 libraries of different types (including university libraries) in Pakistan in order to analyse various features of the websites of these libraries, and online services offered by these libraries. They found that a small number of libraries provided the DRS. As regards provision of access to e-resources, the study revealed that the majority of the libraries had provided access to e-resources of the HEC National Digital Library, whereas a small number of libraries had also provided access to their own e-resources. The library websites of seven universities, i.e., University of the Punjab, Lahore, Agha Khan University, Karachi, Lahore University of Management Sciences, Quaid-e-Azam University, Islamabad, the Government College University, Lahore, University of Management Technology, Lahore and Air University, Islamabad, contained more features than those of the rest of libraries included in the study. Mirza and Mahmood (2009) analysed web-based services in 56 general university libraries in Pakistan, and found that the majority of the libraries had developed their websites, and offered different online services. The study further revealed that five out of fifty six libraries offered asynchronous DRS, whereas only one library provided synchronous DRS. The study also showed that nearly forty five percent libraries provided access to electronic information resources.

Rehman and Mahmood (2010) conducted a study to analyse reference services and resources in sixteen university libraries located in Lahore, and found that DRS was at a developing stage in these libraries due to inadequacy of ICT facilities, and lack of ICT skills and professional knowledge on the part of LIS professionals. In another study, conducted to measure the level of users' satisfaction with electronic resources and services in eight general university libraries in Pakistan, Mirza and Mahmood (2012) found that users were satisfied with different electronic services including the DRS offered by these libraries. They observed that an absence of marketing, inadequate ICT facilities, lack of ICT skills among library staff providing library services, lack of ICT skills among users, and attitude of library staff were the major factors which hampered extensive use of electronic resources and services in these libraries.

Electronic reference and information resources are an essential component of DRS. In Pakistan, HEC-NDL has provided all university libraries, both in the public and private sectors, with access to a large number of electronic reference resources, e-journals, e-books and databases in a wide range of disciplines. The HEC-NDL also provides such material which is not available in its collection to the member library through its e-document delivery service. The HEC-NDL procures such material from the British Library and provides it free of cost to the member library (HEC-NDL, 2013). By providing access to a wide variety of electronic reference and information resources, the HEC-NDL has provided a good opportunity to all the academic libraries in the country to start and manage DRS efficiently. The university libraries can utilise the electronic resources of the HEC-NDL to fulfill users' reference and information needs in the digital environment.

Online access to the library catalogue is a part of DRS as it provides access to the library collection, and helps to offer interactive services, such as selection of books, loan status check, renewal of loans, interlibrary loan, reservation of books, suggestions for books, etc., to users. Mahmood (2008) conducted a study to analyse features and functions of Web OPACs of different types of libraries including academic libraries in Pakistan. He found that all the libraries included in his study had developed Web OPACs. The Web OPACs of these

libraries lacked the features contained by the Web OPACs of modern libraries in developed countries.

3.3.1.3.6 Problems faced by University Libraries of Pakistan

Although university libraries in Pakistan are better placed with respect to resources, organisation and staff as compared to other types of libraries, they are faced with some problems which have affected their growth and services (Haider, 2007, p.172). Mahmood, Hameed and Haider (2006) have observed that libraries, including university libraries, in Pakistan are faced with problems, such as scarcity of competent professional and para-professional staff, shortage of bibliographical sources for selection of local and international materials, lack of library instructions, absence of collection development policies which hampers development of a planned and balanced stock, energy crisis in the country which badly affects library services and operations, lack of ICT skills on the part of LIS professionals. Haider (2004, p.232 & 2007, pp. 172-177) has noted that the university libraries in Pakistan are encountered with a lot of problems in almost every aspect of academic library development. The main issues facing university libraries, as mentioned by him, include: inadequacy of library collections; lack of readers' services; financial constraints; lack of competent human resources particularly for top managerial positions; inadequate physical facilities; absence of resource sharing; problems in acquisition of material; and limited use of ICT by libraries.

Academic libraries need competent professional and para-professional library staff to perform library tasks and provide services efficiently. Warraich and Ameen (2011b) noted that the majority of public sector university libraries, included in their study, lacked professional and para-professional library staff, which had badly affected the quality of library services and prevented these libraries from starting new ICT-based services. Resource sharing helps libraries to share their resources (staff, material, information resources) to facilitate library operations and services. It helps libraries to overcome problems encountered by them. But, unfortunately there exists no practice of resource sharing among university libraries on a formal basis in Pakistan. Ameen (2008)

observed that owing to technical and procedural hurdles, university libraries in Pakistan did not share their resources with one another. Haider (2003) noted that some projects for resource sharing among libraries including university libraries had been launched in the country, but they failed due to an absence of proper planning, shortage of competent human resources, non-availability of standards, limited application of ICT by libraries.

3.4 LIS Education in Pakistan

Formal LIS education in Pakistan began in 1915, when Asa Don Dickinson started a certificate course in LIS at the University of the Punjab, Lahore, and thus he laid the foundation of the first library school in this region. This was the first course of its kind which was started outside the USA. It was open to all until 1928, when admission was restricted to graduates. This course was continued until 1947. After having been suspended between 1947 and 1949, it was restarted in 1950 and raised to Postgraduate Diploma in Library Science in 1959. Master's programme at this school was initiated in 1974 (Haider and Mahmood, 2007). The Master's programme in LIS was first launched by the Department of Library and Information Science at the University of Karachi, Pakistan. This library school was established in 1956 (Samdani and Bhatti, 2011).

At present, nine library schools, eight in the public sector and one in the private sector, provide LIS education at undergraduate and postgraduate levels in the country. Despite making progress in imparting LIS education, Pakistan is encountered with some serious problems in this sector (Haider, 2008, p.83). Haider (2008, p.83) and Ameen (2011, p.174) have observed that the library schools in Pakistan are faced with problems, such as low entrance criteria, lack of PhD faculty members, low intellectual content curricula, lack of ICT-related courses, use of traditional teaching methods, dominance of theoretical courses without practical application, shortage of library material, and poor laboratory facilities.

The HEC designs and revises curricula for various programmes of study in different subjects, including LIS, offered at higher education institutions in Pakistan (Higher Education Commission, 2013a). Mahmood (2003) made a comparison between professional competencies required by academic libraries and LIS curricula followed by library schools in the country at the time of the study. He pointed out deficiencies in the LIS curricula offered by the library schools and stressed the need to revise the curricula keeping in view the market needs of academic librarians. In another study, conducted by Warraich and Ameen (2010b) to explore the employment and learning outcomes of graduates of the library school at the University of the Punjab, the respondents suggested that the curriculum for the Master's programme offered by the school should be made more practically oriented. Warraich and Ameen (2011a) conducted another study to explore the relevance of LIS curriculum followed by the library school at the University of the Punjab to the market needs in the country. They found that although the LIS curriculum was up-to-date and well-designed, it did not develop required employability skills in LIS graduates due to a lack of implementation of the curriculum, and shortage of specialised faculty members at the time of the study. They suggested that the LIS curriculum should be redesigned in order to improve students' skills in some areas, such as ICT, communication, presentation, English language, etc, so that employability skills of graduates of the school are improved. In a recent study, Tufail Khan and Mahmood (2013) compared LIS curricula for the Master's programme followed by the country's nine library schools with the LIS curriculum for the Master's programme designed by the HEC, and found that there was no standard and uniformity in the curricula followed by the library schools. Every school offered courses according to its own interest, which caused problems for graduates of the schools in meeting market needs.

3.4.1 Teaching of Reference Service at Library Schools of Pakistan

The concept of reference service was unknown in the Indo-Pakistan sub-continent as phrases like 'reference books', 'reference services', or 'reference works' are not found in the early writings on librarianship originating from this

region. Asa Don Dickinson omitted 'Reference Service' from the list of courses taught by him at the University of the Punjab. Earlier, A.C Borden, who launched a library course at Baroda, India in 1911, did not include reference service in the contents of his course. The reference service was first recommended to be included in the curriculum for a library course of six-month duration by the first All-India Conference of Librarians (held between 4th and 8th January, 1918 at Lahore) in the Indo-Pakistan sub-continent (Haider, 2008, p.84).

At present, all library schools in Pakistan offer a course on reference service under the title 'Information Sources and Services' for the Master's degree programme (Tufail Khan and Mahmood, 2013), whereas a separate course titled "Basic Reference Sources" for LIS curriculum of a Bachelor's degree programme (revised in 2008-09) has also been approved by the National Curriculum Revision Committee of the HEC (Higher Education Commission, 2013b). The LIS curricula for both Master's and Bachelor's degree programmes approved by the HEC for the library schools show that contents of courses on reference service are traditional and inadequate, and are not systematically organised. Some important topics related to the reference process, such as the reference interview, question analysis, formulating search strategy are missing. Likewise, there is no mention of the Internet as a reference tool, electronic reference sources and online searching (Haider, 2008, p.90; Higher Education Commission, 2013b; Higher Education Commission, 2002).

The lecture method is the most common method to teach all the courses including reference service at library schools in Pakistan. Other methods, such as assignments, class discussion, use of key information tools and sources, or practical aspects of reference librarianship are used only in a few rare cases. A written examination is held at the end of a semester to assess students' learning. The reading lists for the courses on reference service contain old editions as they are not updated regularly. Books of some of the renowned authors in this field, such as *R. E. Bopp and L. C. Smith, and R. Balay* are not included in the list. No library school subscribes to any of the major periodicals related to reference service, such as '*Reference and User Services Quarterly*',

'Reference Services Review', and 'The Reference Librarian' (Haider, 2008, p.88).

3.4.2 Continuing Professional Education

No professional degree programme in the world can claim to provide the learning to be sufficient forever. Learning is a lifelong process which helps professionals to keep their knowledge updated (Ameen, 2011, p.174). Continuing professional education is indispensable for professional development. LIS professionals need to keep themselves abreast of the latest trends and developments taking place in their profession in order to provide efficient services to users, and ensure their (users') satisfaction. Factors, such as the vast growth of new knowledge, the introduction of new technologies in libraries, the social needs of an increasing highly educated society, the introduction of outreach programmes to attract new groups of users, and the changing trends in library services have necessitated the provision of continuing professional education for LIS professionals (Chaudhary, 2001, p.67).

In Pakistan, library schools, libraries, regional, provincial and national library associations organise different programmes, such as short courses, workshops, conferences and seminars on different topics for continuing professional education of LIS professionals. Amongst various library associations organising continuing education programmes in the country, the Pakistan Library Association (PLA), the Pakistan Bibliographical Working Group (PBWG), the Karachi University Library Science Alumni Association (KULSAA), the Punjab University Library Science Alumni Association (PULSAA), the Society for the Promotion and Improvement of Libraries (SPIL), the Pakistan Library Automation Group (PakLAG) and Medical Library Association of Pakistan (MELAP) are the most prominent (Mahmood, Hameed and Haider, 2005, p.132; Haider, 2008, p. 89). In the past, the PLA, with the financial and technical assistance of the NLDP, imparted computer training to 500 working librarians in the country. The PLA in collaboration with USIS also organised a special one-month training course on ICT for LIS professionals in the country (Mahmood, 1996, p. 41). The HEC and some international organisations, such as IFLA,

OCLC, UNESCO, also arrange such training courses for LIS professionals in the country.

Unfortunately, continuing education programmes for LIS professionals are not organised on a regular basis in the country. Batool and Ameen (2010) found that the lack of continuing education programmes in the country was one of the major factors which prevented LIS professionals of the University of the Punjab from improving their ICT skills and keeping themselves up to date with the latest technological developments. Mahmood and Khan (2007) conducted a survey to assess continuing education needs for ICT of LIS professionals in Pakistan, and found that the majority of the LIS professionals needed continuing professional education in various areas of ICT. The respondents wanted library schools and professional library associations to organise workshops and training courses for developing their ICT skills.

3.5 Summary

Pakistan, administratively composed of four provinces, is a developing country located in South Asia. The education system of the country is divided into five levels: primary (grades one through five); middle (grades six through eight); high (grades nine and ten, leading to matriculation or Secondary School Certificate); intermediate (grades eleven and twelve, leading to an F.A. diploma in arts or F.S. science or Higher Secondary Certificate); and university programmes leading to undergraduate and postgraduate degrees. Higher education is provided through universities, DAIs (both in the public and private sectors), and their affiliated colleges in the country. The HEC is responsible for controlling and regulating higher education in the country. With the conversion of the UGC into the HEC in 2002, higher education sector has made remarkable development in the country. A number of existing institutions have been upgraded to the university status, and new universities and DAIs have been established. The HEC has taken a number of steps to improve the existing infrastructure and facilities in the higher education institutions of the country.

All universities and DAIs have set up libraries to support their teaching and research programmes in Pakistan. University libraries are better placed in terms

of resources, organisation and staff as compared to other types of libraries in the country. They provide various services, such as bibliographic and reader services, reference services, microfilming of rare materials, lending services, photocopying services, maintenance of clipping files and pamphlets files, organisation of seminars, lectures and book exhibitions, publication of select and special bibliographies, interlibrary loan, access to electronic resources. The HEC has provided resources to the academic libraries to develop their ICT infrastructure. The HEC has also established a National Digital Library, which contains a number of databases, e-journals and e-books encompassing a wide range of disciplines, and provided all the academic libraries with access to its resources. With the development of ICT, a number of academic libraries in Pakistan have started using ICT to perform different tasks and operations. A small number of academic libraries, with better ICT facilities and competent LIS professionals have also initiated electronic services including DRS. Academic libraries in Pakistan are faced with a number of problems which impair development of electronic services including the DRS in these libraries. These problems include financial constraints, lack of planning, shortage of competent and trained LIS professionals, lack of ICT facilities, lack of training facilities for librarians, unawareness of library users about the use of ICT, lack of expertise, electricity crisis, lack of suitable software.

Chapter 4: Research Methodology

4.1 Introduction

This chapter discusses and presents the methodology adopted in the present research. It describes the philosophy that underpins the research, research design and methods used to collect data for the research. In addition, this chapter also discusses the research sample and the data analysis methods.

4.2 Research Philosophy

When undertaking research, it is essential to consider different research paradigms underlying the research as they influence methodological preferences to undertake the research. Research in Social Sciences is based on two main philosophical considerations related to knowledge: *ontology* and *epistemology*. Ontology is the nature of reality and it is concerned with 'what is', with the nature of existence, with the structure of reality as such, and with what there exists to be investigated (Lincoln and Guba, 1985 cited in Pickard, 2013, p. 6; Crotty, 2005, p. 10; Walliman, 2006, p.15). While, epistemology is concerned with how we can know the reality, and what we can regard as acceptable knowledge in a discipline (Walliman, 2006, p.15; Lincoln and Guba, 1985 cited in Pickard 2013, p.6; Bryman, 2004, p. 11). These philosophical perspectives related to knowledge underpin the main paradigms underlying Social Science research. Pickard (2013, p.6) quoting Kuhn (1970), describes paradigm as the entire constellation of beliefs, values, techniques, and so on which are shared by members of a specific scientific community. Guba (1990), also cited in Pickard (2013, p.6), regards a paradigm as "a basic set of beliefs that guide action." Before discussing the research methodology adopted for this research, it is important to review the main research paradigms underlying Social Science research and comprehend the difference between them as they influence the methodological preference adopted for a specific investigation. The main research paradigms underlying Social Science research are described in the following sections.

4.2.1 Positivist Research

Positivism is the application of the methods of the natural sciences to the study of social reality. It is an objective approach that can test theories and establish scientific laws. It endeavours to establish causes and effects. It gains knowledge by gathering facts that provide the basis for laws. Positivists assume that objective knowledge (facts) can be gained from direct experience or observation, and it is the only knowledge available to science which is largely based on quantitative data derived from the use of strict rules and procedures (Walliman, 2006, p.15; Bryman, 2004, p.11; Robson, 2011, p. 21). Crotty (2005, p. 27) notes that “positivism is linked to empirical science as closely as ever.” Neuman (2007, pp. 42-43) states that positivism considers social research the same as natural science research and assumes that social reality consists of objective facts that researchers can precisely measure, and they can make use of statistics to test causal theories. He observes that the majority of positivist studies are quantitative, and positivists generally see the experiment as the ideal way to undertake research. Hence, positivist researchers adopt precise quantitative measures, test causal theories by applying statistics and believe in the importance of replication of studies.

4.2.2 Post-positivist Research

Post-positivist researchers believe that “a reality does exist but consider that it can only be known imperfectly and probabilistically in part because of the researcher’s limitations” (Robson, 2011, p.22). Post-positivism argues that any perception of reality cannot be an objective picture but is drawn from empirical observation and existing theory (Pickard, 2013, p.10). Guba and Lincoln (1994), cited in Schutt (2006, p. 40), note that post-positivists believe in the existence of an external, objective reality, but at the same time they are sensitive to the complexity of this reality, and to the limitations and biases of those scientists who study this reality. Creswell (2009, p. 7) argues that the post-positivists address the problems that reflect a need to examine causes which affect outcomes. They aim to reduce ideas into discrete sets of concepts that form hypotheses and research questions. The knowledge developed by them is

based on careful observation and measurement of the objective reality that exists. Thus, it becomes essential for the post-positivists to develop numeric measures of observations and study the behaviour of individuals. Denzin and Lincoln (2005, p.11) state that post-positivism relies on multiple methods in order to capture as much of reality as possible and emphasises the discovery and verification of theories. Thus, the post-positivists adopt both quantitative and qualitative methods to understand the phenomena observed.

4.2.3 Interpretive Research

Interpretive research is described by Walliman (2006, p. 15) as “the recognition that subjective meanings play a crucial role in social actions.” It endeavours to reveal interpretations and meanings. Interpretivism requires the social scientist to grasp the subjective meaning of social action and to respect the differences between people and the objects of the natural sciences (Bryman, 2004, p.13). Lynch and Bogen (1997), cited in Schutt (2006, p. 43), note that interpretive social scientists believe that social reality is socially constructed, and that the social scientists aim to comprehend what meanings people give to reality and not to determine how reality works apart from these interpretations. Walsham (1993), cited in Myers (1997), observes that interpretive studies generally endeavour to understand phenomena through the meanings that people give to them. Interpretive researchers argue that human social life is qualitatively different from other things studied by science. Hence, social scientists cannot borrow the principles of science from the natural science. Rather, they believe in the creation of a special type of science, based on the uniqueness of humans, which can capture human social life. The interpretive researchers view social reality as very fluid, and for this reason they tend to trust and favour qualitative data as they believe that qualitative data can more accurately capture the fluid processes of social reality (Neuman, 2007, p.43).

4.2.4 Critical Research

Critical research assumes that social reality is historically constituted, which is produced and reproduced by people. Although people can change their social and economic circumstances, critical researchers believe that their ability to

bring about such changes is constrained by different forms of political, social and cultural domination. Hence, the critical researchers focus on the oppositions, conflicts and contradictions in contemporary society, and endeavour to act as emancipators in order to help to eliminate the causes of alienation and domination (Myers, 1997).

4.3 Approach for This Study

The current research takes a position between positivistic and interpretivistic perspectives and adopts a post-positivist philosophy which encompasses both quantitative (positivist) and qualitative (interpretive) approaches, and relies on a multiple methods approach. Tashakkori and Teddlie (1998, p.8) note that post-positivism is shared by both qualitative and quantitative approaches because it helps to acquire a better common understanding regarding both the nature of knowledge and the conduct of social and behavioural research. The reason for choosing a post-positivistic perspective for the present research is that it develops numeric measures for observation and studies the behaviour of individuals by adopting both quantitative and qualitative approaches, which enables the researcher to capture as much information as possible to understand the phenomenon under investigation.

4.4 Research Design

Research design is a framework for the collection and analysis of data (Bryman, 2004, p.26). The present research adopted a mixed methods research (MMR) design to collect necessary data in order to achieve its aim and objectives, and address the research questions. Figure 4.1 illustrates the research design and methods that were used to gather the data for this research.

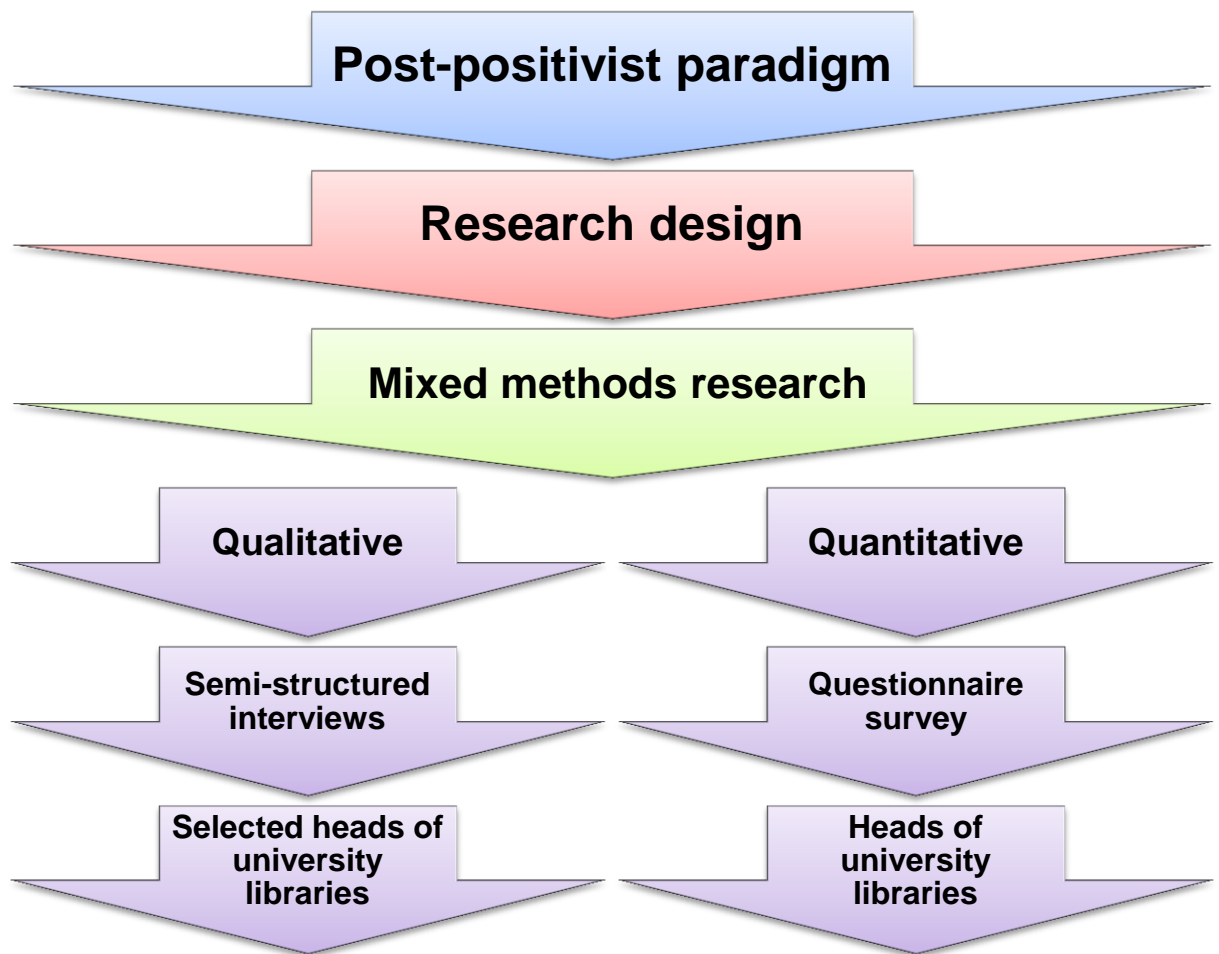


Figure 4.1: Research methodology approach

4.4.1 Mixed Methods Research

Mixed methods research involves applying both quantitative and qualitative methods within a single study. Tashakkori and Creswell (2007, p.4) define mixed methods, “as research in which the investigator collects and analyses data, integrates the findings, and draws inferences using both qualitative and quantitative approaches or methods in a single study or a program of inquiry.” Johnson, Onwuegbuzie and Turner (2007) analysed the definitions for mixed methods research provided by the leading researchers in the mixed methods field, and developed the following general definition of mixed methods research:

“Mixed methods research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference

techniques) for the broad purposes of breadth and depth of understanding and corroboration” (p.123).

Although qualitative and quantitative research approaches are different in many ways, they complement each other as well (Neuman, 2007, p. 84). Both of these research approaches are briefly described below.

4.4.1.1 Quantitative Research

Quantitative research is a research strategy which is concerned with the collection and analysis of data in the form of numbers (Bryman, 2008, p. 22; Blaxter *et al.*, 2001, p. 64), and emphasises relatively large-scale and representative sets of data (Blaxter *et al.*, 2001, p. 64). The researcher’s viewpoint structures the investigation in the quantitative research. In the quantitative research, the researchers are usually uninvolved with their subjects as they regard this lack of relationship with the subjects as desirable because they feel that their objectivity might be affected if they are involved with the subjects of their investigation. Quantitative researchers employ concepts of their research to design the research instruments being used, thus theoretical work precedes the collection of data in the quantitative research. The quantitative research is highly structured which enables the researchers to explore the precise issues that are the focus of their study. Quantitative researchers tend to generalise the findings of their research to the relevant population. Quantitative data are considered to be hard in the sense of being robust and unambiguous due to the precision offered by measurement. Quantitative researchers involve themselves in uncovering large-scale social trends and relationship between variables (Bryman, 2008, pp. 393-394).

4.4.1.2 Qualitative Research

Qualitative research investigates cases by collecting and analysing data in as many forms, not in the form of numbers, as possible (Blaxter *et al.* 2001, p. 64). Qualitative research, as described by Bryman (2008, p. 22), is a research strategy that lays emphasis on words rather than quantification in the collection and analysis of data. Gorman and Clayton (2005, p. 3) define qualitative research as:

“a process of inquiry that draws data from the context in which events occur, in an attempt to describe these occurrences, as a means of determining the process in which events are embedded and the

perspectives of those participating in the events, using induction to derive possible explanations based on observed phenomena.”

The participants’ viewpoints structure the investigation in qualitative research. The qualitative researcher tends to have a close involvement with the people being investigated in order to understand the world through their eyes. The qualitative research is invariably unstructured which enhances the possibility of getting at the participants’ viewpoints. The research concepts emerge out of data collection in the qualitative research. The qualitative research is concerned with small-scale aspects of social reality and attempts to understand behaviour, values, beliefs and so on in terms of the context in which the research is carried out (Bryman, 2008, pp. 393-394).

4.4.1.3 Main Features of Quantitative and Qualitative Research

Both quantitative and qualitative research approaches have their own strengths and weaknesses. Main features of qualitative and quantitative research can be described as follows (Table 4.1).

Table 4.1: Key features of qualitative and quantitative research (adapted from Oakley, 1999, p. 156, cited in Blaxter et al. 2001, p. 65)

Qualitative research	Quantitative research
• Concerned with understanding behaviour from actors’ own frames of reference	• Seeks the facts/causes of social phenomena
• Naturalistic and uncontrolled observation	• Obtrusive and controlled measurement
• Subjective	• Objective
• Close to the data: the ‘insider’ perspective	• Removed from the data: the ‘outsider’ perspective
• Grounded, discovery-oriented, exploratory, expansionist, descriptive, inductive	• Ungrounded, verification oriented, reductionist, hypothetico-deductive
• Process-oriented	• Outcome-oriented
• Valid: real, rich, deep data	• Reliable: hard and replicable data
• Ungeneralisable: single case studies	• Generalisable: multiple case studies
• Holistic	• Particularistic
• Assumes a dynamic reality	• Assumes a stable reality

4.4.2 Rationale for conducting Mixed Methods Research

Combining quantitative and qualitative methods in a research project can provide a number of benefits, such as:

- *Triangulation*: “corroboration between quantitative and qualitative data enhances the validity of findings”
- *Completeness*: combining research approaches produces a more complete and comprehensive picture of the phenomenon under investigation than either quantitative or qualitative research alone
- *Offsetting weakness and providing stronger inferences*: employing a mixed methods design can help to neutralise the limitations of each method while building on their strengths, thus leading to stronger inferences
- *Answering different research questions*: a combination of research approaches helps to address a wide range of research questions
- *Ability to deal with complex phenomena*: mixed methods research is particularly valuable in dealing with complex phenomena
- *Explaining findings*: one research method can be used to explain the data collected through a different method in a study (e.g. findings obtained through a questionnaire survey can be explained and interpreted by conducting follow-up interviews with a sample of those surveyed in order to gain an understanding of the survey findings) (Robson, 2011, p.167).

When compared with single method research, mixed methods research is advantageous in three areas, the ability to address both exploratory and confirmatory questions within the same research study; to draw better inferences; and to gain a greater variety of diverging views (Teddlie & Takkashori, 2009, p.33). Bonoma (1985), cited in Kaplan (1988, p. 575), notes that combining quantitative and qualitative methods introduces both testability and context into the research. He argues that gathering different kinds of data from different sources by using different methods provides a wider range of coverage that may result in a fuller picture of the phenomenon under

investigation than would have been achieved otherwise. Moreover, the use of multiple methods helps to increase the robustness of results. Mixed methods also help to achieve cross validation as different kinds and sources of data converge and are found congruent (Yin, 1984 cited by Kaplan, 1988, p.575). Gorman and Clayton (2005, pp. 12-13) note that mixing both quantitative and qualitative methods has become much popular in library and information research. They argue that mixed methods enable the researcher to address different aspects of the same research question, thus extending the breadth of the research.

In a mixed methods approach, the researcher bases the inquiry on the assumption that gathering different types of data best provides an understanding of a phenomenon (Creswell, 2009, p. 18). The nature of this research, as no previous comprehensive study had been conducted on this topic, required both quantitative and qualitative approaches to be used to collect in-depth data in order to gain a better understanding of the phenomenon. Hence, keeping in view the requirements of the research and benefits of the mixed methods, a mixed methods approach combining both quantitative and qualitative methods was employed to achieve the aim and objectives of the research.

4.4.3 Mixed Methods Strategies

Creswell (2009, pp. 211-216) has identified six types of mixed methods strategies which can be used to conduct mixed methods research, they include:

- ***Sequential explanatory strategy***: It involves the collection and analysis of quantitative data in a first phase followed by the collection and analysis of qualitative data in a second phase. This strategy is used to explain and interpret quantitative findings by collecting and analysing follow-up qualitative data. The two forms of data are integrated in the interpretation (discussion) stage.

- ***Sequential exploratory strategy***: This strategy is similar to the sequential explanatory strategy except that the phases are reversed. In this approach, qualitative data are gathered and analysed first, followed by collecting and analysing quantitative data. It aims to use quantitative results to interpret the qualitative findings gathered in the first phase.
- ***Sequential transformative strategy***: This approach also consists of two distinct data collection phases, one (either quantitative or qualitative) followed by the other (either qualitative or quantitative) as in the first two strategies. Unlike the sequential explanatory and exploratory strategies which may or may not have a specific theoretical perspective, the study with sequential transformative approach is guided by a theoretical perspective. Results of both phases are integrated in the interpretation stage.
- ***Concurrent triangulation strategy***: In this strategy, both quantitative and qualitative data are collected concurrently and then compared to determine if there is convergence, differences or some combination. This model is utilised to compensate for the weakness of one method with the strength of the other. The findings of qualitative and quantitative methods are usually integrated in the interpretation stage.
- ***Concurrent embedded strategy***: In this strategy, both quantitative and qualitative data are gathered in one phase. However, this model has one predominant method that guides the research project with a secondary method embedded within it. The two forms of data are often integrated in the discussion stage.
- ***Concurrent transformative strategy***: This strategy is similar to concurrent triangulation and embedded strategies with regard to the collection of both quantitative and qualitative data in one phase as well as the integration of both forms of data in the interpretation section. However, this strategy is guided by a specific theoretical perspective.

The present research adopted the sequential explanatory strategy. In the first phase, quantitative data were collected which informed the researcher about different aspects of DRS in academic libraries. Whereas, qualitative data were gathered in the second phase, which provided detailed and in-depth information about various important issues related to the research topic and helped to explain the quantitative findings.

4.5 Research Methods

A research method is a technique used for collecting data for the research (Bryman, 2008, p.31). Pickard (2013, p.99) quoting Bell (1999) states that methods are selected to obtain data required for the research. The researcher has to make a decision as to which methods are suitable for particular purposes and then design data-collecting instruments for the research. In order to achieve the aim, objectives and address the research questions, the current study adopted a mixed methods research design by combining both quantitative and qualitative methods. The study employed the questionnaire survey to collect quantitative data, while semi-structured interviews were used to obtain qualitative data. Both of these methods are described in the following sections.

4.5.1 Questionnaire Survey

The questionnaire survey was selected to collect quantitative data for this research. Survey research aims to describe a situation and looks for trends and patterns within the sample group that can be generalised to the targeted population. It studies the relationship between particular variables which are identified at the beginning of the research as either a hypothesis or a research question, or describes certain traits of the population. It can be helpful in measuring many variables efficiently without substantially increasing the time or cost. It is often considered to be the only means available for developing a representative picture of the attitudes and characteristics of a large population. This research method is suitable to studying a large number of cases which are geographically dispersed (as in this research). It can help to collect data from many respondents at relatively low cost and, depending on the survey design,

relatively quickly (Pickard, 2013, pp. 111-112; Denscombe, 2003, p. 27; Schutt, 2006, pp. 234-235; Powell and Connaway, 2004, pp. 84-87).

As the purpose of the present study was to explore the status of DRS in academic libraries in Pakistan (a large number of cases which are geographically dispersed), the questionnaire survey was considered to be a suitable method to collect quantitative data for the research. The reviewed literature indicated that several studies adopted a survey research approach to explore the same phenomenon as the current study (Tenopir, 2001; Tenopir and Ennis, 2002; Marsteller and Neuhaus, 2003; Barry et al., 2010).

4.5.2 Semi-structured Interviews

Semi-structured interviews were employed to gather in-depth qualitative data for this research. The semi-structured interviews are used in flexible designs, either as the sole method or in combination with other methods to collect in-depth data for the research. In the semi-structured interview, the interviewer has an interview guide comprising topics or questions to be covered, but he can modify the wording and order of the questions according to the flow of the interview and ask additional questions as well (Robson, 2011, p. 280). The semi-structured interviews are most appropriate when a quantitative study has been undertaken and qualitative data are required to clarify and illustrate the meaning of the findings of the quantitative study. The semi-structured interviews let the interviewees develop ideas and speak more widely on different issues related to a research topic and lay emphasis on the interviewees' points of view. They can be used alongside other methods as a way of supplementing their data. They are probably the most flexible data collection tool as they provide interviewees the opportunity to express their views, expand their ideas and identify important issues about a research topic. They help to obtain rich and detailed data for the research and lay emphasis on generality in the formulation of initial research ideas (Denscombe, 2003, pp.166-189; Bryman, 2008, p. 437).

4.6 Implementation of Methods

By adopting a mixed methods research approach, the researcher collected both quantitative and qualitative data for this research. In the first phase, the questionnaire survey was used to gather the quantitative data, while the qualitative data were obtained through semi-structured interviews in the second phase. The processes of both of these methods are described below.

4.6.1 Questionnaire Survey

4.6.1.1 Questionnaire Design

On the basis of the literature review on DRS, an online questionnaire (see Appendix A) using Bristol Online Survey (BOS) software was developed. The questionnaire consisted of the following main sections:

Introduction: At the beginning of the questionnaire, an introductory paragraph comprising the purpose of the research, instructions for completing the questionnaire, the researcher's details, and information regarding confidentiality was included so that respondents could understand the importance of the research and fill out the questionnaire easily.

Section 1: General Information about the Library: This section aimed to collect general information, such as category, sector, province/region, year of establishment, library staff, collection, library main users, membership and websites of the participant libraries.

Section 2: Reference Services: This section was designed to explore the current situation of reference services in the participant libraries. It aimed to obtain information regarding reference collection, reference staff, reference desk, types of reference services offered, delivery channels used for the provision of reference services and the average number of reference queries answered through different channels in the responding libraries.

Section 3: Digital Reference Services: The purpose of this section was to explore the status of DRS in the responding libraries. It intended to gather information regarding various aspects of the DRS, such as implementation of the DRS, duration of the DRS, digital reference policy, formats of the DRS, digital reference transactions, turnaround time for the asynchronous DRS, service hours for the synchronous DRS, types of reference questions answered through the DRS, staff handling the DRS, staff training, users' awareness about the DRS, evaluation of the DRS.

Section 4: ICT Infrastructure for DRS: This section aimed to acquire an overview of the ICT infrastructure used for DRS in the participant libraries. It was designed to obtain information about the Internet connection, computers used for handling the DRS, software used for the DRS, the location of the link to the DRS on the library websites, workstations for handling the DRS, maintenance of ICT equipment used for the DRS.

Section 5: Perceptions about DRS: The purpose of this section was to explore respondents' opinions and attitudes about different types of reference questions answered via DRS, the suitability of various formats of DRS for answering different types of reference questions, and the benefits and limitations of DRS. A five-point Likert scale was used to obtain the respondents' opinions regarding benefits and limitations of DRS.

Section 6: Issues regarding DRS: This section was designed to explore issues and problems which affected implementation and management of DRS in the participant libraries. A five-point Likert scale was used to measure the extent of different issues that impacted on the implementation and management of the DRS in the responding libraries. At the end of this section, an open question seeking information regarding any other issue affecting the implementation and management of the DRS in the responding libraries was also added.

4.6.1.2 Pre-test/Pilot Study of Questionnaire

A pre-test, sometimes referred to as a pilot study, provides the researcher an opportunity to identify questionnaire features which tend to be misunderstood by the respondents, problem questions, poor instructions, and unnecessary or missing questions (Powell and Connaway, 2004, pp. 139-140). The pilot study acts as a preventive measure against inconsistencies and ambiguities. Bell (2005, p.147) suggests that all data-collecting instruments should be piloted to find out how long it takes the respondents to complete them, to check that all instructions and questions are clear and understandable, and to enable the researcher to remove any aspects which do not produce usable data. Before sending the online questionnaire to the potential respondents for collecting data, a pilot study of the questionnaire was conducted. For this purpose, the link to the draft online questionnaire was sent by e-mail to the heads of four academic libraries in Pakistan (see Appendix H) and their comments regarding different aspects of the questionnaire, such as construction and layout, instructions, questions wording, time required for completing the questionnaire, were sought. Some comments regarding instructions, questions wording and layout of the questionnaire were received from the four participants. Keeping in view these comments, necessary changes were made in the questionnaire.

4.6.1.3 Distribution of Questionnaires

As the purpose of this research was to explore the status of DRS in university/DAI libraries in Pakistan, libraries of all universities and DAIs recognised by the HEC constituted population for the questionnaire survey. There were 134 HEC recognised universities and DAIs in Pakistan when this survey was conducted, of which 26 were chartered by Government of Pakistan (Federal Government), 38 by Government of Punjab, 35 by Government of Sindh, 25 by Government of Khyber Pakhtoonkhwa, 6 by Government of Balochistan, and 4 by Government of Azad Jammu and Kashmir. Of these 134 universities/DAIs, 74 belonged to the public sector, while 60 came from the private sector (Table 4.2).

Table 4.2: HEC recognised universities/degree awarding institutes in Pakistan in 2011 (Higher Education Commission, 2014)

Chartering authority	Public sector	Private sector	Total
Govt. of Pakistan (Federal Government)	21	05	26
Govt. of Punjab	18	20	38
Govt. of Sindh	13	22	35
Govt. of Khyber Pakhtoonkhwa	15	10	25
Govt. of Balochistan	05	01	06
Govt. of Azad Jammu & Kashmir	02	02	04
Total	74	60	134

A letter requesting participation in the survey (see Appendix B) along with the link to online questionnaire was sent to the heads of central libraries of 125 universities and DAIs in Pakistan through e-mail. The questionnaire could not be sent to one virtual university library and eight other academic libraries as their contact details could not be obtained. One hundred and twenty five

Table 4.3: Questionnaires distributed

Chartering authority	No. of public sector libraries	No. of private sector libraries	Total
Govt. of Pakistan (Federal Government)	19	05	24
Govt. of Punjab	18	16	34
Govt. of Sindh	12	21	33
Govt. of Khyber Pakhtoonkhwa	15	10	25
Govt. of Balochistan	05	0	05
Govt. of Azad Jammu & Kashmir	02	02	04
Total	71	54	125

academic libraries, which were sent the questionnaire, included seventy one public sector academic libraries and fifty four private sector academic libraries, and belonged to different chartering authorities of the country (Table 4.3).

The e-mail addresses of most of the library heads, mentioned on their library websites or university/DAI websites, were incorrect or out dated. So, telephone calls were made to the library heads to obtain their correct e-mail addresses in order to send them the questionnaire. Reminders (see Appendix C) were sent through e-mail and follow-up telephone calls were made to those library heads who did not respond within the stipulated period in order to request them to complete the questionnaire.

After a span of about three months, heads of 83 academic libraries completed and submitted online questionnaires, while heads of 2 academic libraries completed a printed version of the questionnaire and sent it through e-mail. In total, 85 libraries (see Appendix D) responded-a response rate of 68 percent (Table 4.4).

Table 4.4: Questionnaire responses

Chartering authority	Sector	Questionnaires sent out	Questionnaires received	Response rate (%)
Govt. of Pakistan, Federal Government	Public	19	14	74
	Private	05	04	80
Govt. of Punjab	Public	18	16	89
	Private	16	11	69
Govt. of Sindh	Public	12	05	42
	Private	21	14	67
Govt. of Khyber Pakhtunkhwa	Public	15	11	73
	Private	10	06	60
Govt. of Balochistan	Public	05	02	40
	Private	00	00	00
Govt. of Azad Jammu & Kashmir	Public	02	01	50
	Private	02	01	50
Total		125	85	68

4.6.2 Interviews

Interviews were intended to collect rich and detailed information regarding different aspects of the research topic. Keeping in view the aim and objectives, and research questions of the study, an interview schedule (see Appendix E) was developed. The interview schedule helps to allow some amount of control over the interview. It also helps to ensure that the participants have answered all the questions, and serves as a check list. A draft interview schedule was forwarded to supervisors to get their feedback. Some necessary changes were made in the interview schedule keeping in view the suggestions of the supervisors following discussion of several versions. The interview schedule along with a letter requesting participation in the interview (see Appendix F) was sent to selected library heads via e-mail. Telephone calls were also made to some of the library heads in order to request them to take part in the interviews. On receipt of acceptance and schedule for the interviews from the participants, the face-to-face semi-structured interviews with the heads of academic libraries located in five cities, i.e. Islamabad, Rawalpindi, Gujrat, Lahore and Bahawalpur were conducted in the months of June and July 2012. The interviews with the library heads were conducted in their respective offices. The interviews with most of the library heads were conducted in Urdu (the national language of the country) in order to provide them with an opportunity to express their opinions and ideas about different aspects of the research topic freely in their native language. For the purpose of conducting interviews in Urdu, the interview questions were translated from English into Urdu by the researcher. The participants gave their comments and opinions about different issues related to the research. The interviews were recorded using a digital voice recorder.

4.6.2.1 Interview Sampling

Heads of academic libraries were selected employing a purposive sampling technique in order to conduct semi-structured interviews. Patton (2002), cited in Pickard (2013, p. 64), notes that the purposive sampling aims to select information-rich cases for study in depth. The information-rich cases are those from which the researcher can learn a great deal about important issues related to the research. Purposive sampling involves deliberately selecting those cases

which are likely to produce the most valuable information about the research (Denscombe, 2003, p. 15). Bryman (2008, p. 415) notes that in purposive sampling cases are selected “because of their relevance to understanding a social phenomenon.” After a careful consideration, the heads of fifteen academic libraries in five cities of Pakistan were selected for the interviews (see Appendix G). These heads represented both public and private sector academic libraries. The decision to conduct interviews with library heads and not with reference staff or users was made on the basis that they (library heads) were well aware of library policies, practices, different aspects pertaining to management of DRS and issues affecting the management of DRS in their respective libraries. The library heads discussed various aspects of the research topic freely and provided detailed information about various issues. They played an important role in achieving the aim and objectives of the research.

4.7 Data Analysis

The quantitative and qualitative data gathered through mixed methods, by employing the questionnaire survey and semi-structured interviews, were analysed separately. Methods used to analyse both the quantitative and qualitative data are described in the following sections.

4.7.1 Questionnaires

The quantitative data collected through the questionnaire survey were transferred into IBM SPSS, Statistics, V19 for analysis. Descriptive analysis (number and percentages) was used to analyse the quantitative data. Detailed analysis of the data received through the questionnaires is presented in Chapter 5.

4.7.2 Interviews

After collecting data through semi-structured interviews, notes of the interviews were made and important quotes of the interviewees were transcribed by listening to the interview recordings. As most of the interviews were conducted

in Urdu, the interview notes and the interviewees' quotes were translated from Urdu to English. A thematic approach was used to analyse qualitative data collected through the interviews in order to present the participants' views and attitudes regarding different aspects of the research topic. The data were analysed according to themes and sub-themes that emerged. Quotes were added to provide further insight into the interviewees' views about different issues raised during the interviews. Detailed analysis of data collected through the interviews is presented in Chapter 6.

4.8 Summary

The current study adopted a post-positivist philosophy and used a mixed methods research design combining both quantitative and qualitative methods in order to achieve its aim and objectives and answer the research questions. The data for the research were collected in two phases. In the first phase, the quantitative data were collected through an online survey of heads of academic libraries. A total of eighty five library heads completed the survey--a response rate of sixty eight percent. In the second phase, face-to-face semi-structured interviews with selected library heads were carried out in Pakistan in order to obtain in-depth qualitative data for the research. The library heads were selected using purposive sampling, and a total of fifteen library heads were interviewed. The interviewees discussed various issues related to the research topic and provided detailed information which helped to achieve the aim and objectives of the research.

Chapter 5: Questionnaire Analysis

5.1 Introduction

This chapter presents analysis of data collected through the questionnaire survey from academic libraries in Pakistan. The purpose of the survey was to explore the status of DRS, various aspects pertaining to the DRS, and the ICT infrastructure used for the DRS in the academic libraries. It also aimed to obtain academic library heads' perceptions about the DRS, and explore issues and problems affecting implementation and management of the DRS in the academic libraries.

5.2 Analysis

In order to achieve the aim and objectives of the research and answer the research questions, descriptive statistics, such as frequencies and percentages were used to represent and explain the data gathered through the questionnaires. Some of the questionnaires lacked answers to different questions, which were treated as missing data. The main sections of the questionnaires which are presented and analysed in this chapter include:

1. General information about the library
2. Status of reference services
3. Implementation of DRS
4. ICT infrastructure for DRS
5. Perceptions about DRS
6. Issues affecting implementation and management of DRS.

5.2.1 General Information about the Library

The aim of this section is to provide general information about participant academic libraries. It includes category, sector, province/region, year of establishment, library staff, collection, library main users, membership and websites of the participant libraries. All these facets are analysed separately.

5.2.1.1 Category of Academic Library

A total of 85 academic libraries participated in the survey. As shown in table 5.0, the majority of the libraries (47) belonged to general universities. The other libraries included 15 business and information technology university libraries, 11 engineering university libraries, 4 agriculture/veterinary university libraries, 4 art and design university libraries, and 4 health sciences university libraries. Since the majority of universities in Pakistan fall under the category of general university, the number of general university libraries that took part in the survey was higher than that of any other category of academic libraries.

Table 5.0: Category of academic libraries that participated in the survey (N=85)

Category	Number	Percentage
General	47	55.3
Business/I.T	15	17.6
Engineering	11	12.9
Agriculture/Veterinary	04	4.7
Art/Design	04	4.7
Health Sciences	04	4.7
Total	85	100.0

5.2.1.2 Sector

Amongst the participant academic libraries, the majority of the libraries (49, 57.6%) belonged to the public sector, while 36 (42.4%) libraries came from the private sector (Table 5.1). The number of public sector libraries was higher than that of private sector libraries.

Table 5.1: Sector of participant libraries (N=85)

Sector	Number	Percentage
Public	49	57.6
Private	36	42.4
Total	85	100.0

5.2.1.3 Province/Region

Amongst the responding libraries, 30 (35.3%) libraries belong to the province of Punjab. Nearly one-quarter of the libraries (20, 23.5%) are located in Sindh, 17 (20%) libraries in Khyber Pakhtookhwa, 14 (16.5%) libraries in Islamabad, 2 (2.4%) libraries in Balochistan, and another 2 (2.4%) libraries in Azad Jammu and Kashmir (Table 5.2).

Table 5.2: Number of participant libraries in each province/region (N=85)

Province/Region	Sector				Total	%
	Public		Private			
	N	%	N	%		
Islamabad	11	22.5	3	8.3	14	16.5
Punjab	19	38.8	11	30.5	30	35.3
Sindh	5	10.2	15	41.7	20	23.5
Khyber Pakhtoonkhwa	11	22.5	6	16.7	17	20.0
Balochistan	2	4.0	0	.0	2	2.4
Azad Jammu & Kashmir	1	2.0	1	2.8	2	2.4
Total	49	100.0	36	100.0	85	100.0

5.2.1.4 Year of Establishment

The respondents were asked to mention the year of establishment of their respective academic libraries. Eighty four respondents (N=84) provided information regarding the year of establishment of their libraries. As shown in Table 5.3, seven university libraries were established before the creation of Pakistan (i.e. 1947). Amongst the other participant libraries, the majority of the libraries (50, 59.6%) were set up between 1991 and 2011. Eighteen libraries were established between 1948 and 1980, while nine libraries between 1981 and 1990 (Table 5.3).

Table 5.3: Year of establishment of participant libraries (N=84)*

Year of establishment	Number	Percentage
Up to 1947	7	8.3
1948 to 1960	4	4.8
1961 to 1970	3	3.6
1971 to 1980	11	13.1
1981 to 1990	9	10.7
1991 to 2000	25	29.8
2001 to 2011	25	29.8
Total	84	100.0

**84 libraries provided information regarding their year of establishment*

Cross-tabulation was performed to show the development of participant libraries during different periods of time by sector and by category. Amongst the public

Table 5.4: Development of participant libraries by sector (cross tabulation) (N=84)*

Year of establishment	Sector				Total	%
	Public		Private			
	N	%	N	%		
Up to 1947	6	12.2	1	2.8	7	8.3
1948 to 1960	4	8.2	0	.0	4	4.8
1961 to 1970	3	6.1	0	.0	3	3.6
1971 to 1980	11	22.4	0	.0	11	13.1
1981 to 1990	4	8.2	5	14.3	9	10.7
1991 to 2000	6	12.2	19	54.3	25	29.8
2001 to 2011	15	30.6	10	28.6	25	29.8
Total	49	100.0	35	100.0	84	100.0

** 84 libraries provided information regarding their year of establishment*

sector academic libraries, six libraries were set up before the creation of Pakistan, eighteen libraries came into existence between 1948 and 1980, while nearly half of the libraries (25) were established between 1981 and 2011. Amongst the private sector libraries, only one library existed at the time of Pakistan's birth. The rest of the private sector libraries (34) were set up after 1980 in the country. The majority of the private sector libraries (19) were established during the 1990s (Table 5.4).

Amongst various types of academic libraries, 5 general university libraries existed at the time of Pakistan's birth, nearly half of the general university libraries (24) were set up between 1948 and 2000, while 18 general university libraries were established after 2000. All of the business/IT university libraries (15) were set up between 1981 and 2011, while all of the engineering university libraries (10) were established between 1961 and 2011. One

Table 5.5: Development of participant libraries by category (cross tabulation) (N=84)*

Year of establishment		Gen	Bus/IT	Eng.	Agr/vet	Art/des	H. Sc	Total
Up to 1947	N	5	0	0	1	1	0	7
	%	10.6	.0	.0	25.0	25.0	.0	8.3
1948 to 1960	N	4	0	0	0	0	0	4
	%	8.5	.0	.0	.0	.0	.0	4.8
1961 to 1970	N	1	0	1	1	0	0	3
	%	2.1	.0	10.0	25.0	.0	.0	3.6
1971 to 1980	N	7	0	4	0	0	0	11
	%	14.9	.0	40.0	.0	.0	.0	13.1
1981 to 1990	N	3	1	1	1	1	2	9
	%	6.4	6.7	10.0	25.0	25.0	50.0	10.7
1991 to 2000	N	9	10	2	1	2	1	25
	%	19.1	66.7	20.0	25.0	50.0	25.0	29.8
2001 to 2011	N	18	4	2	0	0	1	25
	%	38.3	26.7	20.0	.0	.0	25.0	29.8
Total	N	47	15	10	4	4	4	84
	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0

* 84 libraries provided information regarding their year of establishment

agriculture/veterinary university library existed at the time of Pakistan’s creation, while the rest of the agriculture/veterinary university libraries were set up between 1961 and 2000. Similarly, one art/design university library was established before Pakistan’s birth, while the rest of these libraries came into existence between 1981 and 2000. All of the health sciences university libraries were established between 1981 and 2011 (Table 5.5).

5.2.1.5 Library Staff

The respondents were asked to indicate the number of professional, para-professional, clerical and other staff working in their respective libraries. All the libraries reported that they had professional staff (85,100%), more than three-quarters of the libraries had para-professional staff (67, 79%), three-quarters of the libraries had clerical staff (64, 75%), and nearly three-quarters (62, 73%) of the libraries had other staff. The other staff included library attendants, IT professionals, book binders, messengers, security guards, janitors, peons, cleaners and sweepers. Statistics for staff in various categories are presented in Table 5.6.

Table 5.6: Library staff in participant libraries (N=85)*

Type of staff	Number	Percent	Sum	Mean
Professional	85	100.0	391	4.60
Para-professional	67	79.0	308	4.60
Clerical	64	75.0	317	4.95
Other	62	73.0	472	7.60

**Multiple response*

Cross-tabulation was performed to show the number of different categories of staff in the participant libraries by sector and by category. Amongst the public sector libraries, all the libraries had professional staff (49), about three-quarters of the libraries had para-professional staff (37), 41 libraries had clerical staff, and 45 libraries had other staff. Amongst the private sector libraries, all the libraries had professional staff (36), 30 libraries had para-professional staff, 23

libraries had clerical staff, and nearly half of the libraries had other staff (17) (Table 5.7).

All the libraries, both in the public and private sectors, had professional staff. The number of the private sector libraries having para-professional staff (83.3%) was higher than that of the public sector libraries (75.5%), while the number of the public sector libraries having clerical staff (83.7%) was higher than that of the private sector libraries (63.9%). The public sector libraries had more staff in each category than the private sector libraries. Statistics for various types of staff in the public and private sector libraries are presented in Table 5.7.

Table 5.7: Number of library staff in participant libraries by sector (cross tabulation) (N=85)*

Type of staff		Public	Private	Total
Professional	N	49	36	85
	%	100.0	100.0	100.0
	Sum	292	99	391
	Mean	5.95	2.75	4.60
Para-professional	N	37	30	67
	%	75.5	83.3	79.0
	Sum	221	87	308
	Mean	5.97	2.90	4.60
Clerical	N	41	23	64
	%	83.7	63.9	75.0
	Sum	276	41	317
	Mean	6.73	1.78	4.95
Other	N	45	17	62
	%	91.8	47.2	73.0
	Sum	419	53	472
	Mean	9.31	3.11	7.60

**Multiple response*

All academic libraries in different categories had professional staff. Para-professional staff were employed by all of the engineering university libraries (11) and all of the health sciences university libraries (4). Clerical staff were employed by all of the agriculture/veterinary university libraries (4). The engineering university libraries had more professional staff (with a Mean score of 6.72) than any other category of academic libraries. The agriculture/veterinary university libraries had employed more para-professional

Table 5.8: Number of library staff in participant libraries by category (cross tabulation) (N=85)*

Type of staff		Gen	Bus/IT	Eng.	Agr/vet	Art/des	H. Sc	Total
Professional	N	47	15	11	4	4	4	85
	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Sum	243	34	74	17	6	17	391
	Mean	5.17	2.26	6.72	4.25	1.50	4.25	4.60
Para-professional	N	34	12	11	3	3	4	67
	%	72.3	80.0	100.0	75.0	75.0	100.0	79.0
	Sum	174	36	51	29	3	15	308
	Mean	5.11	3.00	4.63	9.66	1.00	3.75	4.60
Clerical	N	37	11	9	4	1	2	64
	%	78.7	73.3	81.8	100.0	25.0	50.0	75.0
	Sum	218	22	36	32	6	3	317
	Mean	5.89	2.00	4.00	8.00	6.00	1.50	4.95
Other	N	37	6	10	4	2	3	62
	%	78.7	40.0	90.9	100.0	50.0	75.0	73.0
	Sum	325	19	78	34	6	10	472
	Mean	8.78	3.16	7.80	8.50	3.00	3.30	7.61

**Multiple response*

and clerical staff (with Mean scores of 9.66 and 8.00 respectively) than any other type of academic libraries. Whereas, the general university libraries had more other staff (with a Mean of 8.78) than any other category of academic libraries. Statistics for various types of staff in different categories of academic libraries are presented in Table 5.8.

5.2.1.6 Collections

The responding libraries were asked to mention the total number of items in their collections. Eighty three libraries (N=83) provided information regarding their collections. The total number of items of collections in these 83 libraries was 5,314,524 (with a Mean of 64,030.41). Of the eighty three libraries, forty seven (56.6%) libraries belonged to the public sector and held the collection of 4,309,294 volumes (with a Mean score of 91,687.10), while thirty six (43.4%) libraries came from the private sector and had the collection of 1,005,230 volumes (with a Mean score of 27,923.05) (Table 5.9). The public sector libraries had more items in their collections than the private sector libraries. This could be due to the reason that nearly half of the public sector academic

libraries (49%), included in the study, were established earlier than the private sector libraries (Table 5.4), and the collections of these public sector libraries had grown considerably with the passage of time.

Table 5.9: Total volumes of collection in participant libraries (N=83)*

Sector	Number	Percent	Sum	Mean
Public	47	56.6	4,309,294	91,687.10
Private	36	43.4	1,005,230	27,923.05
Total	83	100.0	5,314,524	64,030.41

**83 libraries provided information regarding their collections*

Amongst different types of academic libraries, agriculture/veterinary university libraries had more items in their collections (with a Mean score of 107,435.00) than any other type of libraries. The general university libraries ranked as second in terms of the number of items of collections (with a Mean score of 84,974.41). Art/design university libraries had the least number of items of collections (with a Mean score of 15,625.00) among all types of participant libraries. The total numbers of items of collections in various types of libraries are mentioned in Table 5.10.

Table 5.10: Total volumes of collection in different categories of libraries (N=83)*

Category	Number	Percent	Sum	Mean
Gen	46	55.4	3,908,823	84,974.41
Bus/IT	15	18.1	346,850	23,123.33
Eng.	10	12.0	480,869	48,086.90
Agr/vet	4	4.8	429,740	107,435.00
Art/des	4	4.8	62,500	15,625.00
H. Sc	4	4.8	85,742	21,435.50
Total	83	100.0	5,314,524	64,030.40

**83 libraries provided information regarding their collections*

5.2.1.7 Library Main Users

The participant libraries were asked to indicate their main user groups. As shown in Table 5.11, students were the main user group of all the participant libraries (85,100%). Academic staff were served by 73 (85.9%) libraries, while research staff were the users of more than three-quarters of the libraries (66, 77.6%). 57 (67.1%) libraries reported administrative staff as a user group, while 10 (11.8%) libraries served the other category of users. The other users included students and researchers from other institutes and members of different organisations.

Table 5.11: User groups in participant libraries (N=85)*

User group	Number	Percent
Students	85	100.0
Academic staff	73	85.9
Research staff	66	77.6
Administrative staff	57	67.1
Other	10	11.8

**Multiple response*

5.2.1.8 Library Members

The responding libraries were asked to indicate the number of their library members. Seventy two libraries (N=72) gave information about their membership figure. The total number of library members in these seventy two libraries was 238,733 (with a Mean of 3,315.74). Of the seventy two libraries, 41 (56.9%) libraries belonged to the public sector and had 186,670 library members (with a Mean of 4,552.92), while 31 (43.1%) libraries came from the private sector and had 52,063 library members (with a Mean of 1,679.45). The total number of library members in the public sector libraries was higher than that of the private sector libraries (Table 5.12).

Table 5.12: Number of library members in participant libraries (N=72)*

Sector	Number	Percent	Sum	Mean
Public	41	56.9	186,670	4,552.92
Private	31	43.1	52,063	1,679.45
Total	72	100.0	238,733	3,315.74

**72 libraries provided information about their membership figure*

Amongst different types of academic libraries, agriculture/veterinary university libraries had more library members (with a Mean score of 5,530.00) than any other category of academic libraries, while art/design university libraries had the least number of library members (with a Mean score of 516.66) amongst all types of academic libraries. The total numbers of library members in various types of academic libraries are mentioned in Table 5.13.

Table 5.13: Number of library members in different categories of participant libraries (N=72)*

Category	Number	Percent	Sum	Mean
Gen	41	56.9	166,800	4,068.29
Bus/IT	11	15.3	20,450	1,859.09
Eng.	10	13.9	22,963	2,296.30
Agr/vet	4	5.5	22,120	5,530.00
Art/des	3	4.2	1,550	516.66
H. Sc	3	4.2	4,850	1,616.66
Total	72	100.0	238,733	3,315.74

**72 libraries provided information about their membership figure*

5.2.1.9 Library Website

With the advent of the Internet, academic libraries started to set up websites in order to provide online services. A library website is considered a necessary

adjunct for the provision of online services. It also helps to market and publicise library services and resources. The responding libraries were asked to mention whether they had their own websites. Fifty six (65.9%) libraries reported that they had developed their websites, while twenty nine (34.1%) libraries stated that they had not yet launched a website (Table 5.14).

Table 5.14: Website of participant libraries (N=85)

Web site	Number	Percent
Yes	56	65.9
No	29	34.1
Total	85	100.0

Cross-tabulation was performed to indicate the number of participant libraries having websites by sector and by category. Amongst the public sector libraries, the majority of the libraries (38) had websites. Whereas, amongst the private sector libraries, half of the libraries (18) had developed websites. The number of the public sector libraries having websites was higher than that of the private sector libraries (Table 5.15).

Table 5.15: Website of participant libraries by sector (cross tabulation) (N=85)

Web site	Public		Private		Total	%
	N	%	N	%		
Yes	38	77.6	18	50.0	56	65.9
No	11	22.4	18	50.0	29	34.1
Total	49	100.0	36	100.0	85	100.0

Amongst different categories of academic libraries, all of the agriculture/veterinary university libraries, three-quarters of the art/design university libraries, three-quarters of the health sciences university libraries, 32 general university libraries, 7 engineering university libraries, and 7 business/IT university libraries had developed their websites (Table 5.16).

Table 5.16: Website of participant libraries by category (cross tabulation) (N=85)

Web site		Gen	Bus/IT	Eng.	Agr/vet	Art/des	H. Sc	Total
Yes	N	32	7	7	4	3	3	56
	%	68.1	46.7	63.6	100.0	75.0	75.0	65.9
No	N	15	8	4	0	1	1	29
	%	31.9	53.3	36.4	.0	25.0	25.0	34.1
Total	N	47	15	11	4	4	4	85
	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0

5.2.2 Status of Reference Services

This section aims to present an overview of the status of reference services in participant libraries. It provides information regarding reference collections, reference desks, reference staff, types of reference services offered, channels used for delivering reference services and the average number of reference transactions in the participant libraries. All these components are analysed and explained below.

5.2.2.1 Reference Collections

The participant libraries were asked if they held reference collections. Eighty one out of eighty five libraries (N=81) reported that they had reference collections. Of the eighty one libraries, all the libraries had reference materials in print form (81, 100%), while 59 (72.8%) libraries held reference materials in electronic form (Table 5.17).

Table 5.17: Form of reference collection in participant libraries (N=81)*

Form of collection	Number	Percent
Print	81	100.0
Electronic	59	72.8

**81 libraries held reference collections (Multiple response)*

The responding libraries were further asked to provide the total number of items in their reference collections. Of the eighty one libraries, which had reference collections, seventy seven libraries (N=77) provided information regarding the number of items in their reference collections. The total number of items in reference collections of these libraries was 458,079 (with a Mean of 5,949.07). Of the seventy seven libraries, 46 (59.7%) libraries belonged to the public sector and had a reference collection of 360,600 volumes (with a Mean of 7,839.13), while 31 (40.3%) libraries came from the private sector and held the reference collection of 97,479 volumes (with a Mean of 3,144.48). The public sector libraries had more items in their reference collections (with a Mean of 7,839.13) than the private sector libraries (with a Mean of 3,144.48) (Table 5.18).

Table 5.18: Total volumes in reference collections in participant libraries (N=77)*

Sector	Number	Percent	Sum	Mean
Public	46	59.7	360,600	7,839.13
Private	31	40.3	97,479	3,144.48
Total	77	100.0	458,079	5,949.07

**77 libraries provided information about volumes in their reference collections*

Amongst different types of academic libraries, engineering university libraries had more items in their reference collections (with a Mean of 11,400.25) than any other type of libraries. Agriculture/veterinary university libraries ranked as second in terms of the number of items of reference collections (with a Mean of 8,500.00). Whereas, health sciences university libraries had the least number of items of reference collections (with a Mean of 1,950.00) amongst all types of libraries. The total numbers of items of reference collections in various types of academic libraries are mentioned in Table 5.19.

Table 5.19: Total volumes in reference collections in different categories of libraries (N=77)*

Category	Number	Percent	Sum	Mean
Gen	44	57.1	275,127	6,252.88
Bus/IT	13	16.9	29,450	2,265.38
Eng.	8	10.4	91,202	11,400.25
Agr/vet	4	5.2	34,000	8,500.00
Art/des	4	5.2	20,500	5,125.00
H. Sc	4	5.2	7,800	1,950.00
Total	77	100.0	458,079	5,949.07

**77 libraries provided information about volumes in their reference collections*

5.2.2.2 Reference Desk

Many academic libraries throughout the world set up reference desks staffed by reference staff in order to deliver reference services. The reference desk helps to make the reference service visible and accessible to users. The participant libraries were asked if they had staffed reference desks for the provision of reference services. Thirty three (38.8%) libraries reported that they had staffed reference desks, while 52 (61.2%) libraries stated that they had not set up reference desks (Table 5.20).

Table 5.20: Reference desk in participant libraries (N=85)

Reference desk	Number	Percent
Yes	33	38.8
No	52	61.2
Total	85	100.0

Cross-tabulation was performed to show the number of libraries having staffed reference desks by sector and by category. Amongst the public sector libraries, about half of the libraries (25) had staffed reference desks. While, amongst the

private sector libraries, only eight libraries had set up staffed reference desks. The number of the public sector libraries having staffed reference desks was higher than that of the private sector libraries (Table 5.21). This could be due the reason that the number of the public sector libraries having reference staff was higher than that of the private sector libraries (see Table 5.24).

Table 5.21: Reference desk in public and private sector libraries (cross tabulation) (N=85)

Reference desk	Public		Private		Total	%
	N	%	N	%		
Yes	25	51.0	8	22.2	33	38.8
No	24	49.0	28	77.8	52	61.2
Total	49	100.0	36	100.0	85	100.0

Amongst different types of academic libraries, the majority of the agriculture/veterinary university libraries, nearly half of the engineering university libraries, nineteen general university libraries had set up staffed reference desks (Table 5.22).

Table 5.22: Reference desk in different categories of libraries (cross tabulation) (N=85)

Reference desk		Gen	Bus/IT	Eng.	Agr/vet	Art/des	H. Sc	Total
Yes	N	19	3	6	3	1	1	33
	%	40.4	20.0	54.5	75.0	25.0	25.0	38.8
No	N	28	12	5	1	3	3	52
	%	59.6	80.0	45.5	25.0	75.0	75.0	61.2
Total	N	47	15	11	4	4	4	85
	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0

5.2.2.3 Reference Staff

The responding libraries were asked to indicate whether or not they had designated reference staff. Thirty three libraries (38.8%) reported that they had employed designated reference staff. Of the thirty three libraries, the majority of the libraries (32) had professional reference staff, 23 libraries had para-

professional reference staff, and 16 libraries had other category of reference staff. The other reference staff included library attendants, clerks and messengers. Statistics for reference staff are presented in Table 5.23.

Table 5.23: Reference staff in participant libraries (N=33)*

Type of reference staff	Number	Percent	Sum	Mean
Professional	32	97.0	56	1.75
Para-professional	23	69.7	62	2.70
Other	16	48.5	38	2.38

**33 libraries had reference staff (Multiple response)*

Cross-tabulation was performed to show the number of reference staff of different categories in the participant libraries by sector and by category. Amongst the public sector libraries, 24 libraries had professional reference staff, 20 libraries had para-professional reference staff, and 15 libraries had other reference staff. Amongst the private sector libraries, 8 libraries had employed professional reference staff, 3 libraries para-professional reference staff, and one library other reference staff. The number of the public sector libraries

Table 5.24: Number of reference staff in public and private sector libraries (cross tabulation) (N=33)*

Type of reference staff		Public	Private	Total
Professional	N	24	8	32
	%	96.0	100.0	97.0
	Sum	44	12	56
	Mean	1.83	1.50	1.75
Para-professional	N	20	3	23
	%	80.0	37.5	69.7
	Sum	56	6	62
	Mean	2.80	2.00	2.70
Other	N	15	1	16
	%	60.0	12.5	48.5
	Sum	36	2	38
	Mean	2.40	2.00	2.38

**33 libraries had reference staff (Multiple response)*

having reference staff in all the three categories (professional, para-professional, and other) was higher than that of the private sector libraries. Moreover, the public sector libraries had more reference staff in all the three categories than the private sector libraries. Statistics for reference staff of different categories in the public and private sector libraries are presented in Table 5.24.

Amongst different categories of academic libraries, all but one general university library had professional reference staff. Para-professional reference staff were employed by all except the health sciences university library. Statistics for various types of reference staff employed by different categories of academic libraries are presented in Table 5.25.

Table 5.25: Number of reference staff in different categories of libraries (cross tabulation) (N=33)*

Type of reference staff		Gen	Bus/IT	Eng.	Agr/vet	Art/des	H. Sc	Total
Professional	N	18	3	6	3	1	1	32
	%	94.7	100.0	100.0	100.0	100.0	100.0	97.0
	Sum	29	6	12	5	3	1	56
	Mean	1.61	2.00	2.00	1.66	3.00	1.00	1.75
Para-professional	N	15	1	4	2	1	0	23
	%	78.9	33.3	66.7	66.7	100.0	.0	69.7
	Sum	41	2	10	6	3	0	62
	Mean	2.73	2.00	2.50	3.00	3.00	0.00	2.70
Other	N	10	0	4	2	0	0	16
	%	52.6	.0	66.7	66.7	.0	.0	48.5
	Sum	26	0	9	3	0	0	38
	Mean	2.60	0.00	2.25	1.50	0.00	0.00	2.38

*33 libraries had reference staff (Multiple response)

5.2.2.4 Types of Reference Services offered

Reference service has three basic types: information; instruction; and guidance. The participant libraries were asked to report the types of reference services they offered to users. Seventy seven (90.6%) libraries provided information

services, 73 (85.9%) libraries guidance, and 65 (76.5%) libraries instruction to the users (Table 5.26).

Table 5.26: Type of reference services offered by participant libraries (N=85)*

Type of reference service	Number	Percent
Information	77	90.6
Guidance	73	85.9
Instruction	65	76.5

**Multiple response*

The responding libraries were further asked to indicate the types of information services they offered to users, the methods of instruction they adopted to provide instruction to the users, and the types of guidance they provided to the users. These facets are analysed and explained below.

5.2.2.4.1 Information Services

Academic libraries provide information services to users on their request to meet their specific information needs. Information services have different forms which may range from provision of merely an address or a telephone number

Table 5.27: Type of information services provided by participant libraries (N=77)*

Type of information service	Number	Percent
Quick/Ready reference service	68	88.3
Database searches	65	84.4
Query answering service	64	83.1
Bibliographic verification	48	62.3
Selective dissemination of information	48	62.3

**77 libraries provided information services to users (Multiple response)*

to supply of documents on a specific topic. The responding libraries were asked to mention the types of information services they offered. Seventy seven libraries (N=77) reported that they provided information services. Of these, the majority of the libraries provided quick/ready reference services (68, 88.3%), database searches (65, 84.4%), query answering services (64, 83.1%), bibliographic verification services (48, 62.3%), and selective dissemination of information services (48, 62.3%) (Table 5.27).

5.2.2.4.2 Instruction

Instruction is an important component of reference services in all types of libraries. Instruction aims to teach library users how to use the library and its resources. The participant libraries were asked to indicate the methods they used to impart instruction to users. Sixty five libraries (N=65) reported that they provided instruction to the users. Of these, the majority of the libraries (51, 78.5%) arranged orientation tours, nearly half of the libraries (34, 52.3%) used printed guides and handouts to provide instruction to the users. A number of libraries employed other different methods to impart instruction to the users (Table 5.28)

Table 5.28: Method of instruction adopted by participant libraries (N=65)*

Method of instruction	Number	Percent
Orientation tours	51	78.5
Printed guides and handouts	34	52.3
Information literacy sessions	29	44.6
Induction sessions	28	43.0
Audiovisual presentations	24	36.9
Web-based guides and handouts	23	35.4
Mediated searches	16	24.6
Course- integrated instructions	14	21.5

**65 libraries provided instruction to users (Multiple response)*

5.2.2.4.3 Guidance

Guidance is concerned with suggesting suitable reading materials to particular users. The responding libraries were asked to mention the types of guidance services they provided to users. Seventy three libraries (N=73) reported that they provided guidance services to their users. Of these, 63 (86.3%) libraries offered reader's advisory services, and 61 (83.6%) libraries research assistance and consultation (Table 5.29).

Table 5.29: Type of guidance service offered by participant libraries (N=73)*

Type of guidance service	Number	Percent
Reader's advisory service	63	86.3
Research assistance and consultation	61	83.6

**73 libraries provided guidance services to users (Multiple response)*

5.2.2.5 Channels for Delivering Reference Services

The responding libraries were asked to mention the delivery channels they used to provide reference services. The majority of the libraries reported that they offered reference services through face-to-face consultation (80, 94.1%), and telephone (61, 71.8%). A number of libraries used correspondence (mail) (35, 41.2%) and fax (13, 15.3%) to provide reference services. Whereas, five (5.9%) libraries stated that they did not offer reference services (Table 5.30).

Table 5.30: Channels for delivering reference services in participant libraries (N=85)*

Delivery channel	Number	Percent
Face-to-face consultation	80	94.1
Telephone	61	71.8
Correspondence	35	41.2
Fax	13	15.3
Reference service not provided	5	5.9

**Multiple response*

5.2.2.6 Reference Transactions

Participant libraries were asked to indicate the average number of reference transactions they handled through different channels during a week. Eighty out of eighty five academic libraries (N=80) reported that they provided reference services. Of the eighty libraries, 71 (88.7%) libraries handled 5503 reference transactions through face-to-face consultation, 56 (70.0%) libraries answered 1295 reference questions over telephone, 29 (36.2%) libraries responded to 265 reference questions through correspondence, and 13 (16.2%) libraries provided answers to 89 reference queries via fax during a week. The face-to-face consultation was mostly used for the provision of reference services (with 77.51 Mean reference transactions during a week) in the libraries. Telephone was ranked second (with 23.12 Mean reference transactions in a week), correspondence third (with 9.14 Mean reference transactions in a week), and fax fourth (with 6.85 Mean reference transactions in a week) in terms of the usage for delivery of reference services in the libraries (Table 5.31).

Table 5.31: Average number of reference transactions handled by participant libraries through different channels in a week (N=80)*

Delivery channel	Number	Percent	Sum	Mean
Face-to-face consultation	71	88.7	5503	77.51
Telephone	56	70.0	1295	23.12
Correspondence	29	36.2	265	9.14
Fax	13	16.2	89	6.85

**80 libraries provided reference services (Multiple response)*

5.2.3 Implementation of DRS

This section presents an overview of the responses relating to implementation of DRS in the participant academic libraries. It includes provision of the DRS, duration of the DRS, digital reference policy, formats of the DRS, digital reference transactions, target time for answering queries through the asynchronous DRS, service hours for the synchronous DRS, types of questions answered through the DRS, reference resources used for answering questions

through the DRS, staff for handling the DRS, staff training, users of the DRS, awareness of the DRS and evaluation of the DRS in the participant libraries.

5.2.3.1 Provision of DRS

Participant libraries were asked to mention whether or not they offered DRS. Amongst the academic libraries included in this study, only eighteen (21.2%) libraries reported that they provided the DRS, while 67 (78.8%) stated that they did not offer the DRS (Table 5.32).

Table 5.32: Number of participant libraries offering DRS (N=85)

Digital reference services	Number	Percent
Yes	18	21.2
No	67	78.8
Total	85	100.0

Cross-tabulation was performed to show the number of libraries offering DRS by sector and by category. Amongst the public sector libraries, about one-quarter of the libraries (13) provided the service. Whereas, amongst the private sector libraries, only five libraries offered the service. The number of the public sector libraries offering the service was higher than that of the private sector libraries (Table 5.33).

Table 5.33: Number of participant libraries offering DRS by sector (cross tabulation) (N=85)

Digital reference services	Public		Private		Total	
	N	%	N	%	N	%
Yes	13	26.5	5	13.9	18	21.2
No	36	73.5	31	86.1	67	78.8
Total	49	100.0	36	100.0	85	100.0

Amongst different types of academic libraries, more than one-quarter of the general university libraries (14) provided DRS. The other types of academic libraries offering the service included two engineering university libraries, one agriculture/veterinary university library, and one health sciences university library. While, no business/IT university library, and no art/design university library had implemented the service. The majority of the libraries offering the service were general university libraries (Table 5.34).

Table 5.34: Number of participant libraries offering DRS by category (cross tabulation) (N=85)

Digital reference services		Gen	Bus/IT	Eng.	Agr/vet	Art/des	H. Sc	Total
Yes	N	14	0	2	1	0	1	18
	%	29.8	.0	18.2	25.0	.0	25.0	21.2
No	N	33	15	9	3	4	3	67
	%	70.2	100.0	81.8	75.0	100.0	75.0	78.8
Total	N	47	15	11	4	4	4	85
	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0

5.2.3.1.1 Reasons for not Implementing DRS

The respondents, who did not offer DRS, were asked to mention the reasons why they had not implemented the service. Thirty out of sixty seven respondents (N=30) pointed out the reasons for not implementing the service. Of the thirty respondents, two respondents reported that they were not even aware of the DRS. More than half of the libraries (16) had not developed the service due to lack of resources and ten libraries due to shortage of skilled staff. Nine libraries stated that their staff had no time to manage the service. Another nine libraries had not started the service for want of funds, while 8 libraries indicated that they had no users' demand for the provision of the service. It was found that the majority of the libraries were not offering the service due to the lack of resources (Table 5.35).

Table 5.35: Reasons for not implementing DRS in participant libraries (N=30)*

Reason	Number	Percent
Lack of resources	16	53.3
Lack of skilled staff	10	33.3
Financial constraints	9	30.0
No staff time to run a new service	9	30.0
No users' demand	8	26.7
Not aware of DRS	2	6.7

**30 libraries mentioned reasons for not implementing DRS (Multiple response)*

5.2.3.1.2 Plans for the Future

The respondents, who did not offer DRS, were asked about their future plans regarding implementation of the service. Thirty out of sixty seven respondents (N=30) mentioned their future plans about implementation of the service. Of the thirty libraries, four libraries reported that they had no plan to start the service. Nine libraries planned to start the service in less than 6 months, three libraries in 6-12 months, four libraries in more than 1 year. Ten libraries intended to launch the service, but they were not sure when they would start it (Table 5.36). It was revealed that the majority of the libraries had planned to start the service.

Table 5.36: Future plan of participant libraries for implementation of DRS (N=30)*

Time period	Number	Percent
No	4	13.3
In less than 6 months	9	30.0
In 6-12 months	3	10.0
In more than 1 year	4	13.3
Not sure when	10	33.3
Total	30	100.0

**30 libraries mentioned their future plans about implementation of DRS (Multiple response)*

5.2.3.2 Duration of DRS

Responding libraries were asked to mention how long they had started providing DRS. Of the eighteen libraries offering the DRS, one library had started the service less than 6 months ago, four libraries 1 to 2 years ago, eight libraries 2 to 5 years ago, and five libraries more than 5 years ago (Table 5.37).

Table 5.37: Duration of DRS in participant libraries (N=18)*

Duration	Number	Percent
Less than 6 months	1	5.5
6-12 months	0	.0
1-2 years	4	22.2
2-5 years	8	44.4
More than 5 years	5	27.8
Total	18	100.0

**18 libraries offered DRS*

Cross-tabulation was performed to show the duration of DRS in libraries by sector and by category. Amongst the public sector libraries, five libraries had

Table 5.38: Duration of DRS in participant libraries by sector (cross tabulation) (N=18)*

Duration	Public		Private		Total	
	N	%	N	%	N	%
Less than 6 months	1	7.7	0	0.0	1	5.5
6-12 months	0	0.0	0	0.0	0	0.0
1-2 years	2	15.4	2	40.0	4	22.2
2-5 years	5	38.5	3	60.0	8	44.4
More than 5 years	5	38.5	0	0.0	5	27.8
Total	13	100.0	5	100.0	18	100.0

**18 libraries offered DRS*

started the service more than five years ago, another five libraries 2-5 years ago, two libraries 1-2 years ago and one library less than 6 months ago. Amongst the private sector libraries, three libraries had launched the service 2-5 years ago, and two libraries 1-2 years ago. The public sector libraries had started the service earlier than the private sector libraries (Table 5.38).

Amongst various types of academic libraries, the majority of the general university libraries (8) had launched DRS more than one year ago, while five general university libraries had started the service more than five years ago. Both of the engineering university libraries had initiated the service more than one year ago. Whereas, one agriculture/veterinary university library, and one health sciences university library had launched the service more than two years ago. It was found that the general university libraries had developed the service earlier than any other type of academic libraries (Table 5.39).

Table 5.39: Duration of DRS in participant libraries by category (cross tabulation) (N=18)*

Duration		Gen	Bus/IT	Eng.	Agr/vet	Art/des	H. Sc	Total
Less than 6 months	N	1	0	0	0	0	0	1
	%	7.1	.0	.0	.0	.0	.0	5.5
6-12 months	N	0	0	0	0	0	0	0
	%	.0	.0	.0	.0	.0	.0	.0
1-2 years	N	3	0	1	0	0	0	4
	%	21.4	.0	50.0	.0	.0	.0	22.2
2-5 years	N	5	0	1	1	0	1	8
	%	35.7	.0	50.0	100.0	.0	100.0	44.4
More than 5 years	N	5	0	0	0	0	0	5
	%	35.7	.0	.0	.0	.0	.0	27.8
Total	N	14	0	2	1	0	1	18
	%	100.0	.0	100.0	100.0	.0	100.0	100.0

*18 libraries offered DRS

5.2.3.3 Policy for DRS

The participant libraries were asked to mention whether they had a policy for DRS. Of the eighteen libraries, eight libraries reported that they had devised a

digital reference policy, while ten libraries stated that they had no policy for the DRS (Table 5.40).

Table 5.40: Digital reference policy in participant libraries (N=18)*

Digital reference policy	Number	Percent
Yes	8	44.4
No	10	55.6
Total	18	100.0

**18 libraries offered DRS*

5.2.3.4 Formats of DRS

The responding libraries were asked to mention the formats they used to offer DRS. Of the eighteen libraries, the majority of the libraries (12) provided the service through e-mail, and six libraries via web forms. One library employed web-based chat, while another one adopted instant messaging (IM) to offer the service. Seven libraries had developed frequently asked questions (FAQs) to

Table 5.41: Format of DRS used in participant libraries (N=18)*

Format of DRS	Number	Percent
E-mail reference	12	66.6
Frequently Asked Questions (FAQs)	7	38.9
Web-form	6	33.3
Web chat	1	5.5
Instant messaging (IM)	1	5.5
Voice over Internet Protocol (VoIP)	0	.0
Video-conferencing	0	.0
Collaborative digital reference	0	.0

**18 libraries offered DRS (Multiple response)*

provide the service. None of the libraries offered the service through Voice over Internet Protocol (VoIP), video-conferencing and collaborative digital reference (Table 5.41).

Cross-tabulation was performed to indicate the formats used for the provision of DRS in the participant libraries by sector and by category. Amongst the public sector libraries, the majority of the libraries (9) used e-mail to offer the service. Five libraries provided the service via FAQs, four libraries through web forms, and one library via IM. Amongst the private sector libraries, three libraries offered the service through e-mail, two libraries via FAQs, another two through web forms, and one library through web-based chat. It was found that most of the libraries, both in public and private sectors, provided the asynchronous DRS through e-mail, web forms and FAQs. Only two libraries, one in the public sector and another one in the private sector, provided the synchronous DRS via IM and web-based chat respectively (Table 5.42).

Table 5.42: Format of DRS used in participant libraries by sector (cross tabulation) (N=18)*

Format of DRS	Public		Private		Total	
	N	%	N	%	N	%
E-mail reference	9	69.2	3	60.0	12	66.6
Frequently Asked Questions (FAQs)	5	38.5	2	40.0	7	38.9
Web-form	4	30.8	2	40.0	6	33.3
Web chat	0	0.0	1	20.0	1	5.5
Instant messaging (IM)	1	7.7	0	0.0	1	5.5
Voice over Internet Protocol (VoIP)	0	0.0	0	0	0	0.0
Video-conferencing	0	0.0	0	0	0	0.0
Collaborative digital reference	0	0.0	0	0	0	0.0

**18 libraries offered DRS (Multiple response)*

Amongst various types of academic libraries, the majority of the general university libraries (9) used e-mail to provide DRS. Five general university libraries provided the service through FAQs, and another five via web forms. One general university library used web-based chat, and another one IM to offer the service. Of the two engineering university libraries, one library used FAQs and web form, and another one e-mail to deliver the service. One agriculture/veterinary university library employed e-mail and FAQs, and one health sciences university library used e-mail to provide the service. It was revealed that all the libraries in different categories mostly provided asynchronous DRS. Only two general university libraries offered synchronous DRS (one via web-based chat and another one through IM) (Table 5.43).

Table 5.43: Format of DRS used in participant libraries by category (cross tabulation) (N=18)*

Format of DRS		Gen	Bus/IT	Eng.	Agr/vet	Art/des	H. Sc	Total
E-mail reference	N	9	0	1	1	0	1	12
	%	64.3	.0	50.0	100.0	.0	100.0	66.6
Frequently Asked Questions (FAQs)	N	5	0	1	1	0	0	7
	%	35.7	.0	50.0	100.0	.0	.0	38.9
Web-form	N	5	0	1	0	0	0	6
	%	35.7	.0	50.0	.0	.0	.0	33.3
Web chat	N	1	0	0	0	0	0	1
	%	7.1	.0	.0	.0	.0	.0	5.5
Instant messaging (IM)	N	1	0	0	0	0	0	1
	%	7.1	.0	.0	.0	.0	.0	5.5
Voice over Internet Protocol (VoIP)	N	0	0	0	0	0	0	.0
	%	.0	.0	.0	.0	.0	.0	.0
Video-conferencing	N	0	0	0	0	0	0	0
	%	.0	.0	.0	.0	.0	.0	.0
Collaborative digital reference	N	0	0	0	0	0	0	0
	%	.0	.0	.0	.0	.0	.0	.0

*18 libraries offered DRS (Multiple response)

5.2.3.5 Digital Reference Transactions

The participant libraries were asked to provide the average number of digital reference transactions handled by them through different formats of DRS during a week. Of the eighteen libraries, twelve libraries handled 393 reference transactions via e-mail, six libraries answered 148 reference queries asked through the web form during a week. One library handled 80 reference transactions through IM, while another one responded to 30 reference questions through web-based chat in a week. Mean scores of reference transactions handled by the libraries through e-mail, web form, IM and web-based chat during a week were 32.75, 24.66, 80.00 and 30.00 respectively (Table 5.44).

The total number of digital reference transactions handled by academic libraries through various formats of DRS during a week was 651 (with 36.17 Mean reference transactions in a week). It shows that the usage of the DRS was low as compared to that of face-to face reference (with 77.51 Mean reference transactions during a week) in academic libraries (Table 5.31).

Table 5.44: Average number of digital reference transactions handled in participant libraries (N=18)*

Format of DRS	Number	Percent	Sum	Mean
E-mail reference	12	66.6	393	32.75
Web-form	6	33.3	148	24.66
Instant messaging (IM)	1	5.5	80	80.00
Web chat	1	5.5	30	30.00

**18 libraries offered DRS (Multiple response)*

Cross-tabulation was performed to show the average number of digital reference transactions handled through different formats in the participant libraries by sector and by category. Amongst the public sector libraries, nine

libraries answered 258 queries via e-mail, four libraries handled 110 reference transactions through web forms, and one library responded to 80 reference questions via IM in a week. Amongst the private sector libraries, three libraries handled 135 reference transactions through e-mail, two libraries responded to 38 queries asked via web forms, and one library answered 30 reference questions through web-based chat during a week. The private sector libraries answered more reference queries through e-mail (with a Mean score of 45.00) than the public sector libraries (with a Mean score of 28.66). Whereas, the public sector libraries handled more reference questions via web forms (with a Mean score of 27.50) than the private sector libraries (with a Mean score of 19.00). The number of synchronous digital reference transactions (via IM/web-based chat) handled by the public sector library (with a Mean score of 80.00) was higher than that of the private sector library (with a Mean score of 30.00) (Table 5.45).

Table 5.45: Average number of digital reference transactions handled in participant libraries by sector (cross tabulation) (N=18)*

Format of DRS		Public	Private	Total
E-mail reference	N	9	3	12
	%	69.2	60.0	66.6
	Sum	258	135	393
	Mean	28.66	45.00	32.75
Web-form	N	4	2	6
	%	30.8	40.0	33.3
	Sum	110	38	148
	Mean	27.50	19.00	24.66
Instant messaging (IM)	N	1	0	1
	%	7.7	.0	5.5
	Sum	80	0	80
	Mean	80.00	00.00	80.00
Web chat	N	0	1	1
	%	.0	20.0	5.5
	Sum	0	30	30
	Mean	00.00	30.00	30.00

* 18 libraries offered DRS (Multiple response)

Amongst different types of academic libraries, nine general university libraries answered 269 reference queries via e-mail, five general university libraries handled 120 reference transactions through web forms, one general university

library responded to 80 reference questions via IM, and another one handled 30 reference transactions through web-based chat during a week. Of the two engineering university libraries, one library responded to 20 queries via e-mail, while another one handled 28 reference transactions through web forms during a week. One agriculture/veterinary university library answered 4 reference questions via e-mail, while one health sciences university library handled 100 reference transactions through e-mail in a week. The health sciences university library answered more queries via e-mail (with a Mean of 100.00) than any other type of academic libraries. Whereas, the engineering university library handled more reference transactions through web forms (with a Mean of 28.00) than the general university libraries (with a Mean of 24.00) (Table 5.46).

Table 5.46: Average number of digital reference transactions handled in participant libraries by category (cross tabulation) (N=18)*

Format of DRS		Gen	Bus/IT	Eng.	Agr/vet	Art/des	H. Sc	Total
E-mail reference	N	9	0	1	1	0	1	12
	%	64.3	.0	50.0	100.0	.0	100.0	66.6
	Sum	269	0	20	4	0	100	393
	Mean	29.88	0.00	20.00	4.00	0.00	100.00	32.75
Web-form	N	5	0	1	0	0	0	6
	%	35.7	.0	50.0	.0	.0	.0	33.3
	Sum	120	0	28	0	0	0	148
	Mean	24.00	0.00	28.00	0.00	0.00	0.00	24.66
Instant messaging (IM)	N	1	0	0	0	0	0	1
	%	7.1	.0	.0	.0	.0	.0	5.5
	Sum	80	0	0	0	0	0	80
	Mean	80.00	0.00	0.00	0.00	0.00	0.00	80.00
Web chat	N	1	0	0	0	0	0	1
	%	7.1	.0	.0	.0	.0	.0	5.5
	Sum	30	0	0	0	0	0	30
	Mean	30.00	0.00	0.00	0.00	0.00	0.00	30.00

* 18 libraries offered DRS (Multiple response)

5.2.3.6 Target Time for answering Queries via Asynchronous DRS

The responding libraries were asked to mention the target time to answer a reference question through asynchronous DRS. Eleven out of twelve libraries, which offered e-mail reference, (N=11) provided information regarding their target time to answer a query. Of these, three libraries answered a reference

question in less than one hour of its receipt, four libraries in 1 to 6 hours, two libraries in 12 to 24 hours, and another two libraries took 1 to 4 working days to respond to a query. Of the six libraries offering DRS via web forms, two libraries responded to a reference question in 1 to 6 hours of its submission, one library in 12 to 24 hours, and three libraries took 1 to 2 working days to answer a query. It was found that the majority of the libraries (12) answered a query within one day of its submission (Table 5.47).

Table 5.47: Target time for answering queries through asynchronous DRS

Target time	E-mail reference (N=11)*		Web form (N=6)	
	Number	Percent	Number	Percent
Less than 1 hour	3	27.3	0	.0
1-6 hours	4	36.4	2	33.3
6-12 hours	0	.0	0	.0
12-24 hours	2	18.2	1	16.7
1-2 working days	1	9.1	3	50.0
2-4 working days	1	9.1	0	.0
More than 4 working days	0	.0	0	.0
Total	11	100.0	6	100.0

**11 libraries provided information about their target time for reply through e-mail*

5.2.3.7 Service Hours for Synchronous DRS

Users can submit their reference questions through asynchronous DRS at any time and they receive answers to their questions from the reference librarian after a certain time. But for posing reference questions and receiving their answers through synchronous DRS both the user and the reference librarian need to be online simultaneously in order to interact with each other. Some libraries offer the synchronous DRS 24/7, while some libraries provide this service for fixed hours. The participant libraries were asked to mention their service hours for the synchronous DRS. Both of the libraries, which offered the

synchronous DRS, reported that they provided the service for 8 hours per working day (Table 5.48).

Table 5.48: Service hours for synchronous DRS

Service hours	Web-based chat (N=1)		I M (N=1)	
	Number	Percent	Number	Percent
8 hours per working day	1	100.0	1	100.0
Total	1	100.0	1	100.0

5.2.3.8 Types of Reference Questions answered through DRS

Users ask various types of reference questions to reference staff in academic libraries. A reference question has different types, such as directional, procedural, quick/ready reference, specific-search, reader's advisory and research. The responding libraries were asked to mention the types of reference questions they answered through DRS. Amongst the eighteen libraries, the majority of the libraries (15) reported that they provided answers to specific-search questions. More than three-quarters of the libraries (14) answered research questions, while half of the libraries (9) responded to readers' advisory questions. Eleven libraries provided answers to quick/ready reference questions, eight libraries to directional questions, and five libraries to procedural questions (Table 5.49).

Table 5.49: Types of reference questions answered by participant libraries through DRS (N=18)*

Type of reference question	Number	Percent
Specific search	15	83.3
Research	14	77.8
Quick/Ready reference	11	61.1
Reader's advisory	9	50.0
Directional	8	44.4
Procedural	5	27.8

**18 libraries offered DRS (Multiple response)*

5.2.3.9 Reference Resources used for DRS

Academic libraries use different types of reference resources, such as print, electronic, web-based reference resources, in order to provide answers to users' reference questions. The responding libraries were asked to indicate the types of reference resources they used to answer users' queries through DRS. Of the eighteen libraries, all the libraries used their own catalogues to provide answers to reference queries. More than three-quarters of the libraries utilised print reference resources (16), and free web-based reference resources (14) to respond to reference questions. Whereas, more than half of the libraries used licensed or fee-based digital reference resources (10), and in-house electronic reference resources (11) to answer users' queries. It was revealed that after library catalogues, print reference resources were utilised by the majority of the libraries for answering reference questions (Table 5.50).

Table 5.50: Reference resources used for answering queries through DRS in participant libraries (N=18)*

Type of reference resource	Number	Percent
Your library catalogue	18	100.0
Print reference resources	16	88.9
Free web-based reference resources	14	77.8
In-house electronic reference resources	11	61.1
Licensed or fee-based digital reference resources	10	55.6
Catalogues of other libraries	8	44.4

**18 libraries offered DRS (Multiple response)*

5.2.3.10 Staff for Handling DRS

In some academic libraries, the reference staff handle DRS along with face-to-face reference, while some libraries assign the task of operating DRS to separate staff. The respondents were asked to indicate the staff who handled DRS in their respective libraries. Amongst the eighteen academic libraries, the

majority of the libraries (12) reported that their reference staff handled the DRS, three libraries pointed out that their para-professional staff was responsible for providing the service. Eight libraries had assigned the task of handling the service to skilled library staff, while other staff (library head) provided the service in one library (Table 5.51).

Table 5.51: Staff responsible for handling DRS in participant libraries (N=18)*

DRS handled by	Number	Percent
Reference staff	12	66.7
Highly skilled library staff devoted to DRS	8	44.4
Para-professional staff	3	16.7
Other (Library head)	1	5.5

**18 libraries offered DRS (Multiple response)*

5.2.3.11 Staff Training

Library staff need to be trained in ICT and DRS skills in order to handle the DRS effectively. The respondents were asked to indicate how their library staff got formal training in ICT and DRS skills. Amongst the eighteen libraries, two-thirds of the libraries (12) reported that their library staff learned ICT and DRS skills from their colleagues. More than half of the libraries (11) organised in-house training sessions to train their library staff in ICT and DRS skills. Seven libraries stated that their library staff had received formal training in ICT and DRS skills through a professional degree programme, while another seven libraries pointed out that their staff were trained in ICT and DRS skills through continuing education classes. The library staff learned ICT and DRS skills on their own by trial and error in seven libraries, and through software vendors in two libraries (Table 5.52).

Table 5.52: Staff training for handling DRS (N=18)*

Source	Number	Percent
Colleagues	12	66.7
In-house training sessions	11	61.1
Continuing education classes	7	38.9
Professional degree program	7	38.9
Self-taught	7	38.9
Software vendors	2	11.1

**18 libraries offered DRS (Multiple response)*

5.2.3.12 Users of DRS

Academic libraries provide services to various types of users, such as students, academic staff, research staff, administrative staff and some special users. The responding libraries were asked to indicate to whom they provided DRS. Of the eighteen libraries, all the libraries pointed out that they provided the service to students, research staff and academic staff. Eight libraries offered the service to administrative staff, while two libraries to other users. The other users included external members of the libraries. Students, academic staff and research staff, who constitute the main user community of an academic library, were served by all the libraries (Table 5.53).

Table 5.53: Users of DRS in participant libraries (N=18)*

Type of user	Percent	Number
Students	18	100.0
Research staff	18	100.0
Academic staff	18	100.0
Administrative staff	8	44.4
Other	2	11.1

**18 libraries offered DRS (Multiple response)*

5.2.3.13 Awareness of DRS

Academic libraries need to publicise and market their services in order to make users aware of the services. Marketing library services helps users to benefit from the services. Academic libraries adopt different techniques to make users aware of their services. The responding libraries were asked to indicate how they made users aware of their DRS. Of the eighteen libraries, the majority of the libraries (16) reported that they used their websites to make users aware of the service. More than three-quarters of the libraries (14) familiarised users with the service through guidance. More than half of the libraries made users aware of the service through information literacy sessions (10), and through the library's promotional activities (10). Four libraries organised training in order to familiarise users with the service, while one library adopted another method (face book page) to publicise the service (Table 5.54).

Table 5.54: Methods used for awareness of DRS in participant libraries (N=18)*

Method	Number	Percent
Library web site	16	88.9
Guidance	14	77.8
Information literacy sessions	10	55.5
Library's promotional activities	10	55.5
Training	4	22.2
Other (face book page)	1	5.5

**18 libraries offered DRS (Multiple response)*

5.2.3.14 Archiving Digital Reference Transactions

Some academic libraries archive reference questions and their answers so that they can use them readily to provide answers to the same questions at a later stage. It helps the reference staff to save time and minimise labour in answering the same reference questions. It also helps to assess the quality and standards of reference services. Participant libraries were asked to indicate if they

archived digital reference transactions. Of the eighteen libraries, eight libraries reported that they archived reference questions and answers, while ten libraries stated that they did not archive reference transactions (Table 5.55).

Table 5.55: Archiving of digital reference transactions in participant libraries (N=18)*

Archiving digital reference transactions	Number	Percent
Yes	8	44.4
No	10	55.6
Total	18	100.0

**18 libraries offered DRS*

5.2.3.15 Evaluation of DRS

Regular assessment of services helps academic libraries to measure the quality and standards of the services they offer. It also helps the academic libraries to make necessary adjustments, identified in the assessment process, in the services and to improve the quality of the services. The responding libraries were asked to indicate whether they evaluated their DRS. Of the eighteen libraries, half of the libraries (9) reported that they evaluated the service, while half of the libraries did not assess the service (Table 5.56).

Table 5.56: Evaluation of DRS in participant libraries (N=18)*

Evaluation of DRS	Number	Percent
Yes	9	50.0
No	9	50.0
Total	18	100.0

**18 libraries offered DRS*

The responding libraries were further asked to mention the method they used to evaluate their DRS. Of the nine academic libraries (N=9), which evaluated the DRS, all of the libraries conducted user surveys to evaluate their services. (Table 5.57).

Table 5.57: Method used for evaluation of DRS in participant libraries (N=9)*

Method	Number	Percent
Users' feedback/survey	9	100.0
Analysis of question logs	0	.0
Review of transcripts	0	.0

**9 libraries evaluated DRS (Multiple response)*

5.2.3.16 Web OPAC

Access to a library catalogue is a part of DRS, and a link to the catalogue is provided on the library website. Academic libraries can provide several interactive services, such as selection of books, loan status check, renewal of loans, reservation of books, request for interlibrary loan, suggestions for books, information about new acquisition, etc through their Web OPACs. The responding libraries were asked to state whether they had Web OPACs. Of the eighteen academic libraries, most of the libraries (13) reported that they had Web OPACs, while five libraries stated that they had not developed Web OPACs (Table 5.58).

Table 5.58: Web OPAC in participant libraries (N=18)*

Web OPAC	Number	Percent
Yes	13	72.2
No	5	27.8
Total	18	100.0

**18 libraries offered DRS*

The responding libraries were further asked to mention the services they provided through their Web OPACs. All the libraries (N=13), which had Web OPACs, facilitated selection of books through the Web OPACs. More than three-quarters of the libraries (10) provided users with an opportunity to make suggestions for new books. Nine libraries provided the service for loan status check. The other services provided by the participant libraries through the Web

OPACs included information about fines, reservation of books, information about new acquisition, renewal of loans and interlibrary loan request (Table 5.59).

Table 5.59: Services provided through web OPAC in participant libraries (N=13)*

Service	Number	Percent
Selection of books	13	100.0
Suggestions for books	10	76.9
Loan status check	9	69.2
Fine accrued	6	46.1
Reservation of books	6	46.1
New acquisition/arrivals	5	38.5
Renewal of loans	4	30.8
Inter library loan request	3	23.0

**13 libraries had web OPACs (Multiple response)*

5.2.3.17 Online Access to Information Resources

Online access to various electronic resources, such as e-books, e-journals, databases is a part of DRS. The responding libraries were asked to indicate the

Table 5.60: Online access to information resources in participant libraries (N=18)*

Information resource	Number	Percent
Electronic books	18	100.0
Electronic journals	18	100.0
Online databases	18	100.0
Internet resources	12	66.7
Other libraries' Web OPACs	8	44.4

**18 libraries offered DRS*

electronic resources to which they provided online access. Of the eighteen libraries, all the libraries provided online access to e-books, e-journals and databases. Twelve libraries provided online access to the Internet resources, while eight libraries to other libraries' Web OPACs (Table 5.60).

5.2.4 ICT Infrastructure for DRS

This section presents an overview of the responses relating to ICT infrastructure used for DRS in the participant libraries. It includes computers used for handling the DRS, Internet connection, software used for IM reference, link to the DRS, accessibility to the DRS, user ID and passwords for accessing the DRS, workstations for the DRS, and maintenance of ICT facilities. All these elements are analysed and explained separately.

5.2.4.1 Computers used for DRS

Computers are essential tools for operating DRS. The respondents were asked to mention the number of computers they used for handling the DRS in their respective libraries. Eleven out of eighteen libraries, provided information about the number of computers used for operating the service. The total number of computers used for handling the service in these eleven libraries was 67 (with a Mean of 6.09). Of the eleven libraries, seven libraries belonged to the public sector and had 38 computers (with a Mean of 5.42), while four libraries came from the private sector and had 29 computers (with a Mean of 7.25). The private sector libraries had more computers for handling the service (with a Mean of 7.25) than the public sector libraries (with a Mean of 5.42) (Table 5.61).

Table 5.61: Number of computers used for DRS in participant libraries (N=11)*

Sector	Number	Percent	Sum	Mean
Public	7	63.6	38	5.42
Private	4	36.4	29	7.25
Total	11	100.0	67	6.09

**11 libraries provided information about number of computers used for DRS*

Amongst various categories of academic libraries, general university libraries had more computers (with a Mean of 6.55) for handling DRS than any other type of libraries (Table 5.62).

Table 5.62: Number of computers used for DRS in different categories of libraries (N=11)*

Category	Number	Percent	Sum	Mean
Gen	9	100.0	59	6.55
Bus/IT	0	.0	0	0.00
Eng.	0	.0	0	0.00
Agr/vet	1	100.0	3	3.00
Art/des	0	.0	0	0.00
H. Sc	1	100.0	5	5.00
Total	11	100.0	67	6.09

** 11 libraries provided information about number of computers used for DRS*

5.2.4.2 The Internet Connection

The quality of the Internet plays an important role in offering an effective DRS. At present, nearly fifty Internet Service Providers operate in the country (Internet Service Providers Association of Pakistan, 2013). Besides, the HEC has established a project, 'PERN', to provide an Internet service to higher education institutions and research organisations in the country (Pakistan Education and Research Network, 2013). The respondents were asked to indicate their Internet Service Providers. Of the eighteen academic libraries, fourteen libraries provided information about the Internet Service Providers. Of these fourteen libraries, half of the libraries had been provided with an Internet connection through PERN, four libraries through Pakistan Telecommunication Company Ltd. (PTCL), two through National Telecommunication Corporation (NTC), and one through Wateen (Table 5.63).

Table 5.63: Internet Service Providers of participant libraries (N=14)*

Internet Service Provider	Number	Percent
HEC PERN	7	50
PTCL	4	28.6
NTC	2	14.3
Wateen	1	7.1
Total	14	100.0

**14 libraries provided information regarding Internet service provider*

5.2.4.3 Software used for IM Reference

Libraries require specific IM software to provide IM reference. A number of free and commercial software products, with certain capabilities and restrictions, are available for IM. The academic libraries, which offered the IM reference, were asked to indicate the software product they used to provide the IM reference. The only academic library offering the IM reference reported that it used a free software product named 'Meebo' to provide the service.

5.2.4.4 Link to DRS

A library website is considered a necessary adjunct for DRS as it mediates reference queries. The location of the link to the DRS on the library website has great importance as it helps users to find and access the service. The participant libraries were asked to indicate the location of the link to the DRS on their websites. Amongst the eighteen libraries, half of the libraries had provided a direct link to the DRS on their homepages. Whereas, half of the libraries had an indirect link to the DRS on the homepages. Of these, six libraries had provided the indirect link to the DRS from 'services', two libraries from 'contact us', and one library from 'about the library' (Table 5.64). Academic libraries need to make their services accessible and visible so that users can easily access them. A visible direct link to the DRS on a library's homepage helps users greatly to access and use the service. Realising the importance of the location of the service link on the library website, half of the libraries had placed a direct link to the DRS on their homepages.

Table 5.64: Link to DRS on participant libraries' websites (N=18)*

Location of DRS link	Number	Percent
Home page	9	50
Under services	6	33.3
Under contact us	2	11.1
Other	1	5.6
Total	18	100.0

** 18 libraries offered DRS*

5.2.4.5 Accessibility to DRS

One of the benefits of DRS is that it can be accessed from anywhere at any time. Some academic libraries restrict the use of their online services and resources to the campus, whereas some others provide access to online services and resources both within the campus and outside the campus. The responding libraries were asked to indicate where their DRS can be accessed from. Of the eighteen libraries, all the libraries reported that their DRS were accessible both on-campus and off-campus (Table 5.65).

Table 5.65: Accessibility to DRS in participant libraries (N=18)*

Accessibility to DRS	Number	Percent
On-campus	18	100.0
Off-campus	18	100.0

** 18 libraries offered DRS (Multiple response)*

5.2.4.6 User ID and Passwords for accessing DRS

Some academic libraries require users to utilise their IDs and passwords in order to access online library services including DRS. The use of the users' IDs and passwords helps to restrict the use of online services only to registered library members, thus avoiding misuse of the services. The responding libraries were asked to mention whether they required their users to utilise IDs and

passwords to access the DRS. Of the eighteen libraries, only one library reported that it had restricted the use of the DRS to its affiliated users by requiring them to utilise their IDs and passwords, while seventeen libraries stated that their users did not need to use IDs and passwords to access the service (Table 5.66).

Table 5.66: Requirement of user ID and passwords for DRS (N=18)*

User ID and passwords	Number	Percent
Yes	1	5.6
No	17	94.4
Total	18	100.0

** 18 libraries offered DRS*

5.2.4.7 Workstation for DRS

Some academic libraries use the traditional reference desk for the provision of DRS along with face-to-face reference, while some others set up a separate desk for the DRS. Respondents were asked to provide information regarding the workstation used for handling the DRS in their respective libraries. Of the eighteen libraries, more than half of the libraries (10) reported that they used the traditional reference desk to provide DRS, while eight libraries stated that they had set up a separate desk to handle the service (Table 5.67).

Table 5.67: Workstation for DRS in participant libraries (N=18)*

Location	Number	Percent
At traditional reference desk	10	55.6
At a separate desk	8	44.4
Total	18	100.0

** 18 libraries offered DRS*

5.2.4.8 Maintenance of ICT Facilities used for DRS

The ICT infrastructure used for handling DRS needs to be maintained for better performance. Responding libraries were asked to indicate who maintained their ICT equipment used for the DRS. Of the eighteen libraries, the majority of the libraries (11) reported that their staff maintained the ICT equipment, while seven libraries stated that they obtained services of ICT experts in their institutions to maintain ICT facilities (Table 5.68).

Table 5.68: Maintenance of ICT facilities in participant libraries (N=18)*

ICT facilities maintained by	Number	Percent
Library staff	11	61.1
ICT experts within the university	7	38.9
ICT experts outside the university	0	0.0
Total	18	100.0

** 18 libraries offered DRS*

5.2.5 Perceptions about DRS

This section presents perceptions of the respondents regarding various aspects of DRS. It includes the respondents' opinions about different types of reference questions answered through the DRS, the suitability of various formats of the DRS for answering different types of reference questions, and the benefits and limitations of the DRS.

5.2.5.1 Types of Reference Questions

The respondents were asked to give their opinions as to how well different types of reference questions can be answered through DRS. The respondents' opinions with regard to answering different types of reference questions are presented in the following sections.

5.2.5.1.1 Quick/Ready Reference Questions

Quick/ready reference questions consist of such questions that can be answered by a reference librarian in a short period of time by providing a fact or piece of information (ODLIS, 2013). The respondents were asked to express their opinions as to how well quick/ready reference questions can be answered through DRS. The majority of the respondents (60, 70.6%) were of the opinion that the quick/ready reference questions are well served by the DRS, while six (7.1%) respondents thought that the quick/ready reference questions are poorly served by the DRS. Eight (9.4%) respondents were of the opinion that the quick/ready reference questions are neither well nor poorly served by the DRS. Eleven (12.9%) respondents had no opinion about it (Figure 5.1).

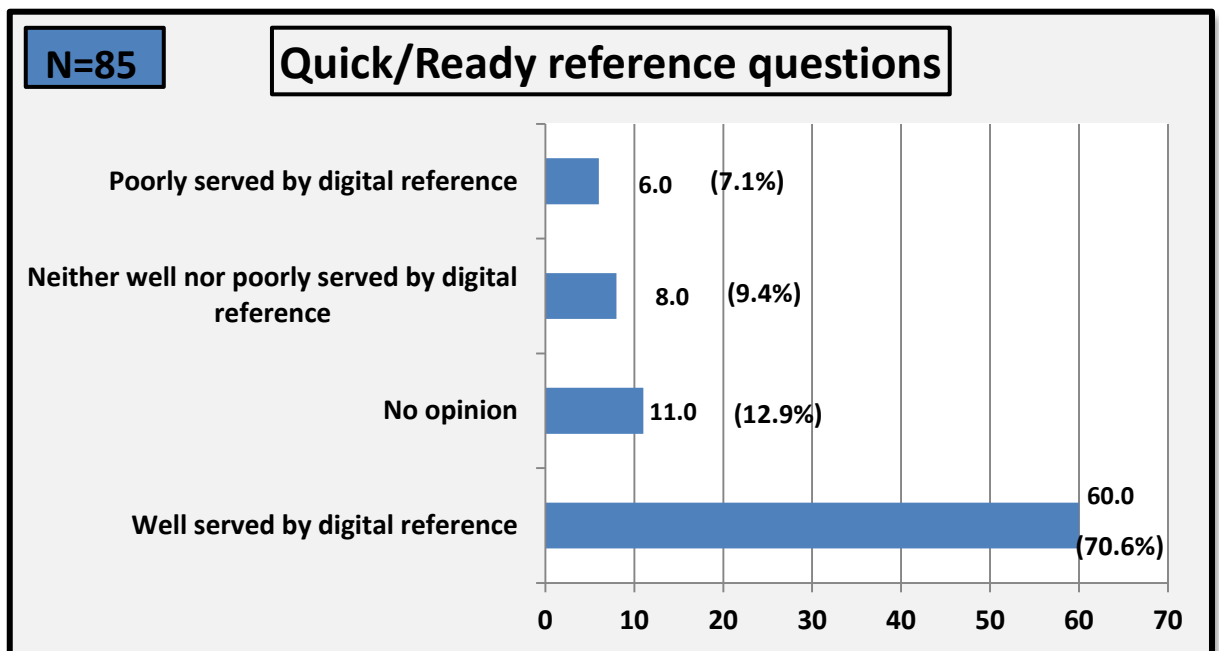


Figure 5.1: Respondents' opinions about quick/ready reference questions

5.2.5.1.2 Detailed Research Questions

Research questions require a reference librarian to provide detailed information on a specific topic after consulting a wide variety of information sources. Research questions are usually asked by a specialist in a specific field. The respondents' opinions with regard to answering detailed research questions through DRS were sought. The majority of the respondents (53, 62.4%)

considered that the detailed research questions can be well served by the DRS, while only nine (10.6%) respondents expressed negative opinions and noted that the detailed research questions are poorly served by the DRS. Six (7.1%) respondents thought that the detailed research questions are neither well nor poorly served by the DRS, whereas seventeen (20%) respondents had no opinion about it (Figure 5.2).

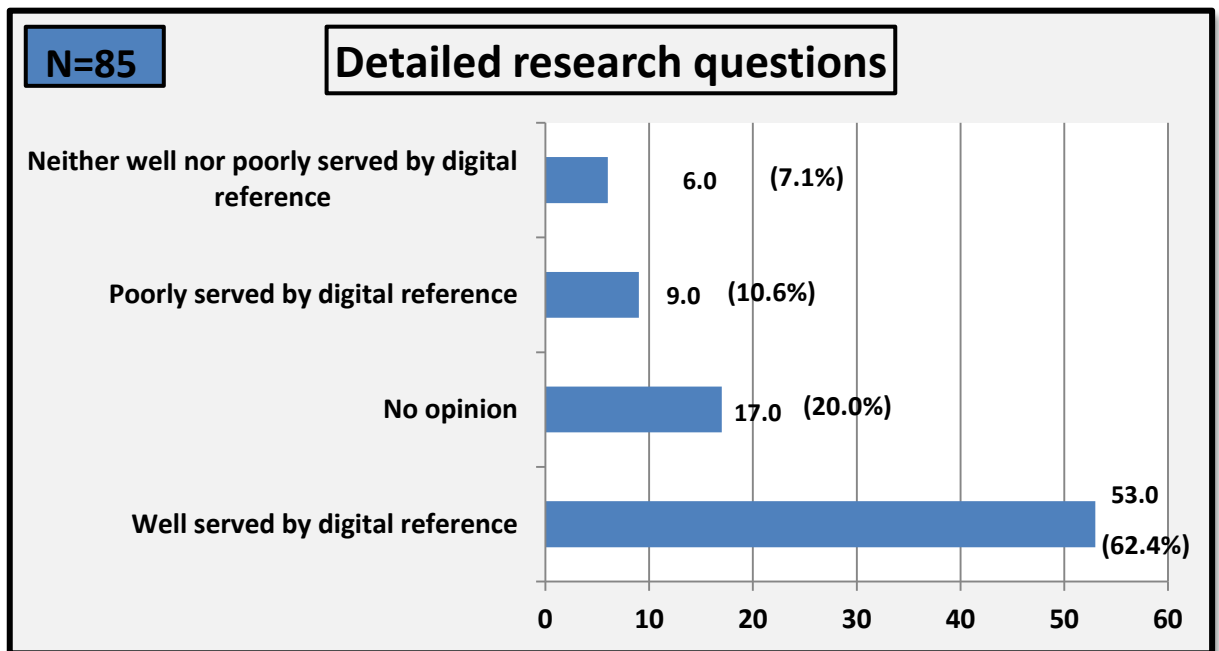


Figure 5.2: Respondents' opinions about detailed research questions

5.2.5.1.3 Reader's Advisory Questions

Reader's advisory questions are requests from users for suggesting appropriate reading materials for them. The respondents were asked to express their views as to how well reader's advisory questions are answered through DRS. The majority of the respondents (48, 56.5%) thought that reader's advisory questions are well served by the DRS, while ten (11.8%) respondents thought the opposite and noted that the reader's advisory questions are poorly served by the DRS. Only six (7.1%) respondents considered that the reader's advisory questions are neither well nor poorly served by the DRS. Twenty one (24.7%) respondents had no opinion about it (Figure 5.3).

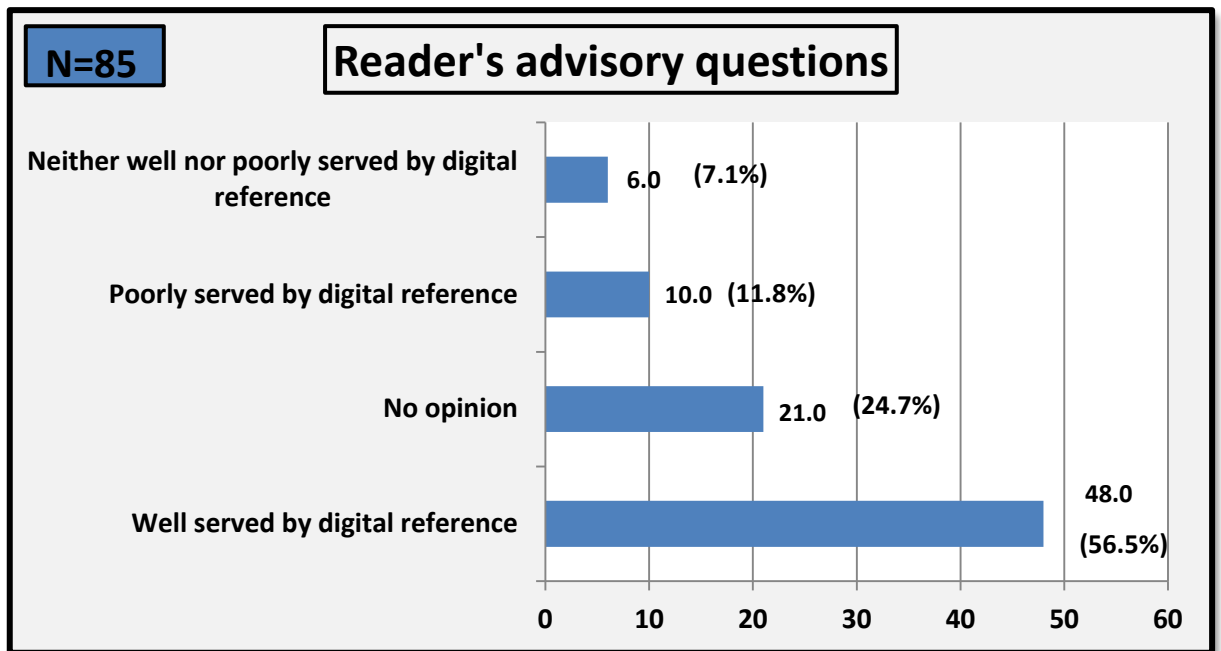


Figure 5.3: Respondents' opinions about reader's advisory questions

5.2.5.1.4 Directional Questions

Directional questions consist of queries regarding general information, and their answers require geographical knowledge of key locations. For instance, 'Where is the catalogue?', 'Where are the indexes?', 'Where is the telephone?', etc. (Katz, 2002, p 16). Users may ask directional questions regarding the location of various online resources on a library's website through DRS. The

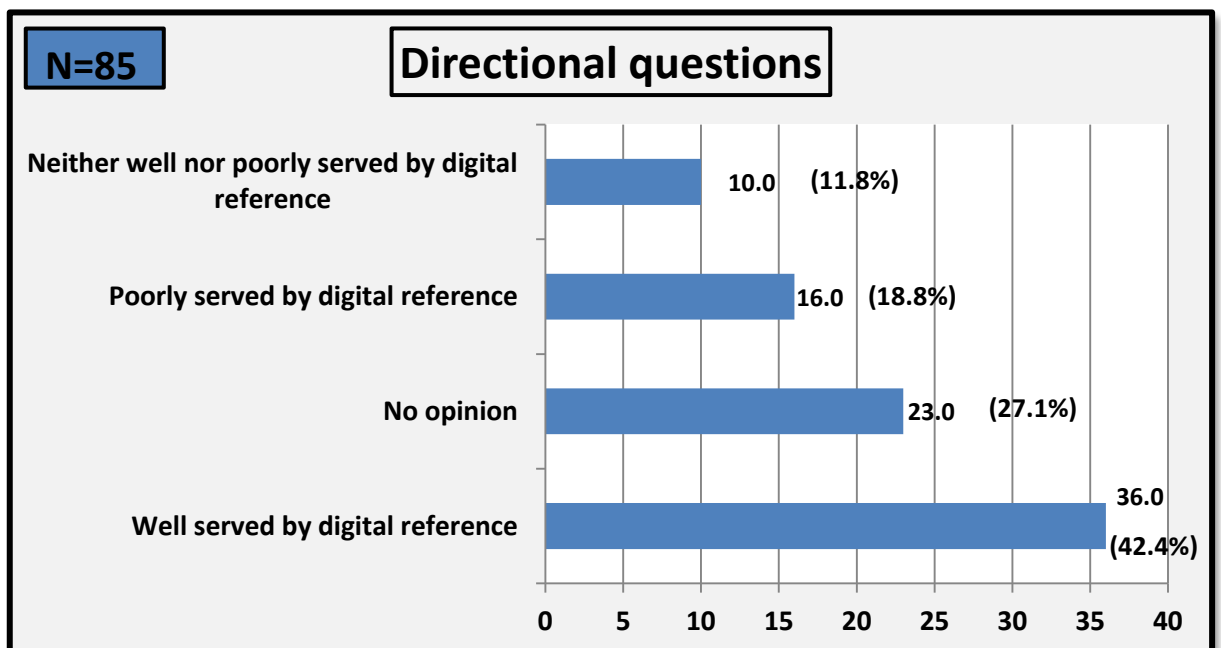


Figure 5.4: Respondents' opinions about directional questions

respondents' opinions varied with regard to answering the directional questions through DRS. 36 (42.4%) respondents noted that the directional questions are well served by the DRS, 16 (18.8%) respondents did not support the idea and thought that the directional questions are poorly served by the DRS, 10 (11.8%) respondents were of the opinion that the directional questions are neither well nor poorly served by the DRS, and 23 (27.1%) respondents did not express their opinions about it (Figure 5.4).

5.2.5.1.5 Procedural Questions

Procedural questions consist of queries from users seeking information regarding procedures for certain library activities, for instance, 'How to get library membership?', 'How to get books issued?', 'How to pay fine?', etc. Mixed opinions with regard to answering procedural questions through DRS were received. 32 (37.6%) respondents noted that the procedural questions are well served by the DRS, while 12 (14.1%) respondents had negative opinions and thought that the procedural questions are poorly served by the DRS. 9 (10.6%) respondents were of the opinion that the procedural questions are neither well nor poorly served by the DRS, while 32 (37.6%) respondents had no opinion about it (Figure 5.5).

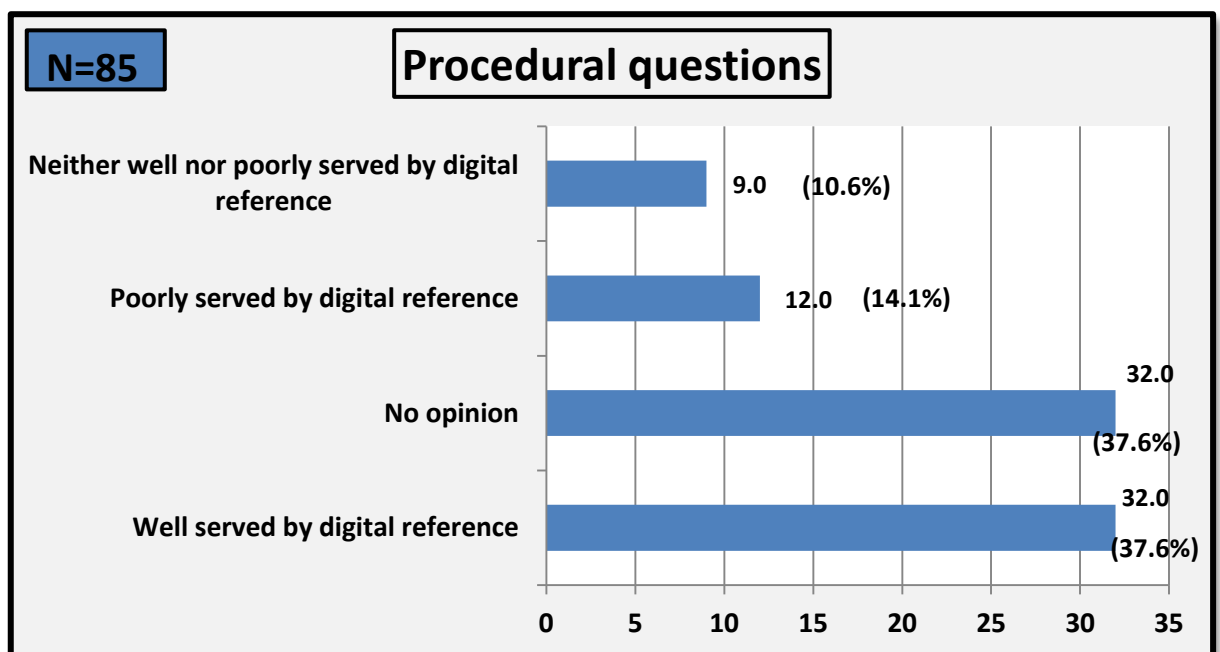


Figure 5.5: Respondents' opinions about procedural questions

5.2.5.2 Formats of DRS

Respondents' opinions with regard to the suitability of various formats of DRS for answering different types of reference questions are presented in the following sections.

5.2.5.2.1 E-mail Reference

The respondents were asked to give their opinions about the suitability of e-mail reference for answering different types of reference questions. The majority of the respondents (60, 70.6%) were of the opinion that quick/ready reference questions can be well answered through e-mail reference, while 29 (34.1%) respondents thought that detailed research questions are well served via e-mail reference. 18 (21.2%) participants opined that e-mail reference is suitable for answering reader's advisory questions, whereas 14 (16.5%) respondents were of the view that directional questions can be handled in an efficient manner via e-mail reference. 10 (11.8%) participants thought that procedural questions can be well answered through e-mail reference, while 11 (12.9%) respondents did not express their opinions about it (Figure 5.6).

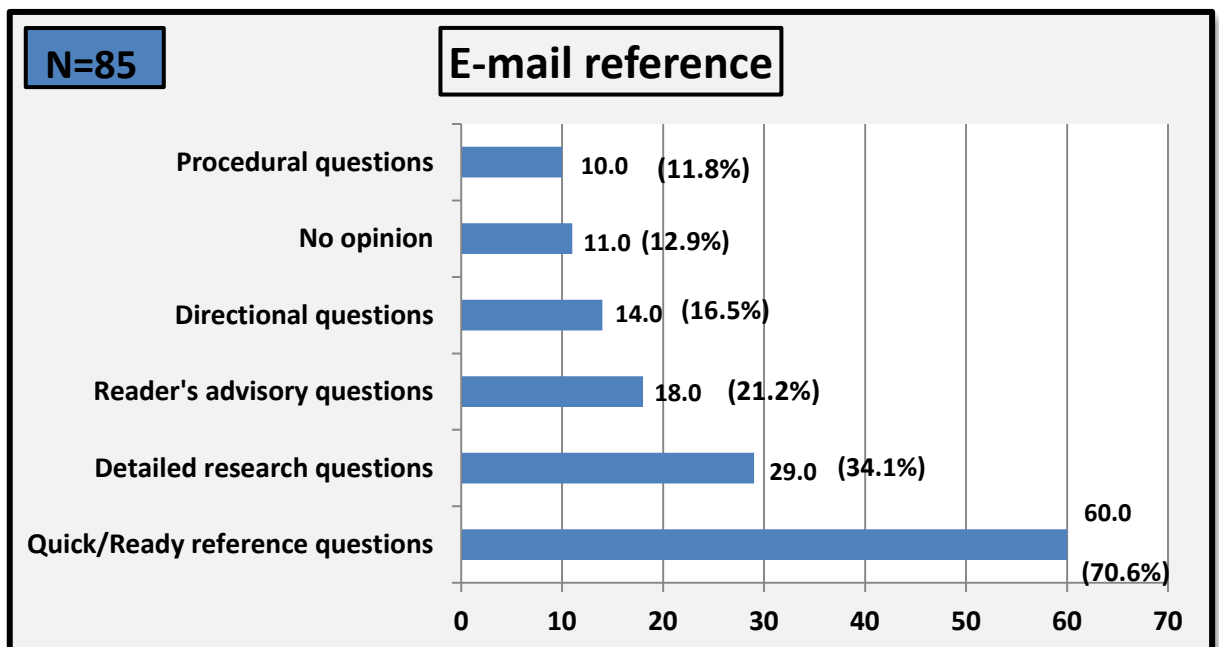


Figure 5.6: Respondents' opinions about e-mail reference (N=85, multiple response)

5.2.5.2.2 Web Form

Mixed opinions with regard to the suitability of a web form for handling different types of reference questions were received. 26 (30.6%) respondents noted that the web form is suitable for handling quick/ready reference questions. 15 (17.6%) participants thought that detailed research questions can be well served through the web form, another 15 (17.6%) respondents opined that the web form is suitable for handling reader's advisory questions. 9 (10.6%) respondents were of the view that directional questions are well served via the web form, another 9 (10.6%) respondents viewed the web form as a suitable means for handling procedural questions. While, 38 (44.7%) respondents had no opinion about it (Figure 5.7).

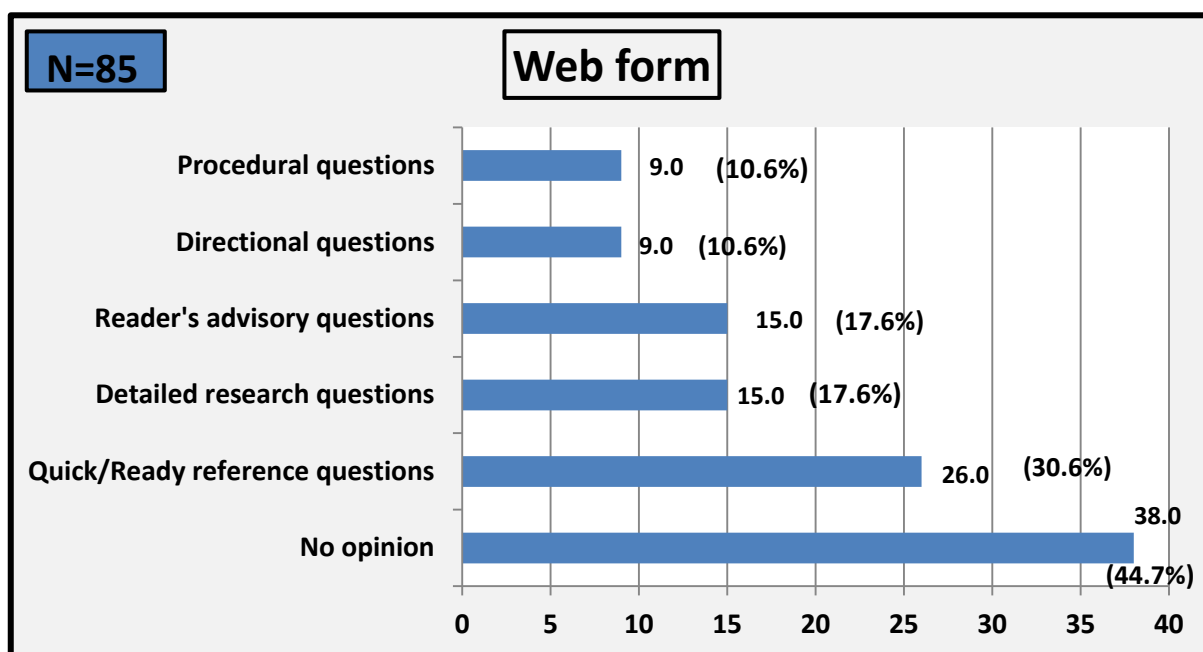


Figure 5.7: Respondents' opinions about web form (N=85, multiple response)

5.2.5.2.3 Frequently Asked Questions

The respondents were asked to express their opinions with regard to answering various types of reference questions through Frequently Asked Questions (FAQs). 35 (41.2%) respondents were of the opinion that quick/ready reference questions can be well answered through FAQs, 14 (16.5%) participants thought that reader's advisory questions are well served through FAQs. FAQs appeared

to be a suitable means for answering procedural questions to 8 (9.4%) respondents. 7 (8.2%) respondents noted that directional questions are well answered via FAQs, whereas no respondent (0, 0.0%) considered the FAQs to be a suitable means for handling detailed research questions. 33 (38.8%) participants had no opinion about it (Figure 5.8).

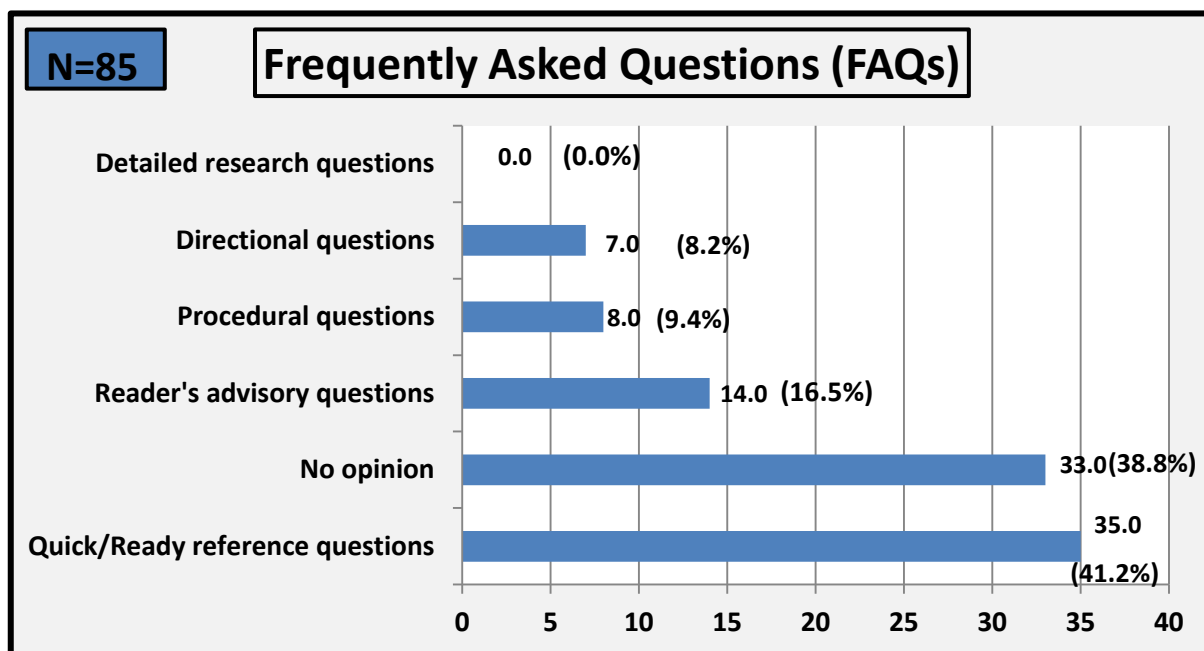


Figure 5.8: Respondents' opinions about FAQs (N=85, multiple response)

5.2.5.2.4 Web-based Chat

The respondents' opinions varied with regard to the suitability of web chat for answering different types of reference questions. 27 (31.8%) respondents thought that quick/ready reference questions can be well served through web chat, while 16 (18.8%) participants were of the view that reader's advisory questions can be answered in an efficient manner via web chat. 10 (11.8%) respondents opined that directional questions are well handled through web chat, whereas 8 (9.4%) respondents were of the view that detailed research questions can be well answered via web chat. The web chat appeared to be a suitable means for answering procedural questions to 6 (7.1%) participants. 41 (48.2%) respondents did not give their opinions about it (Figure 5.9).

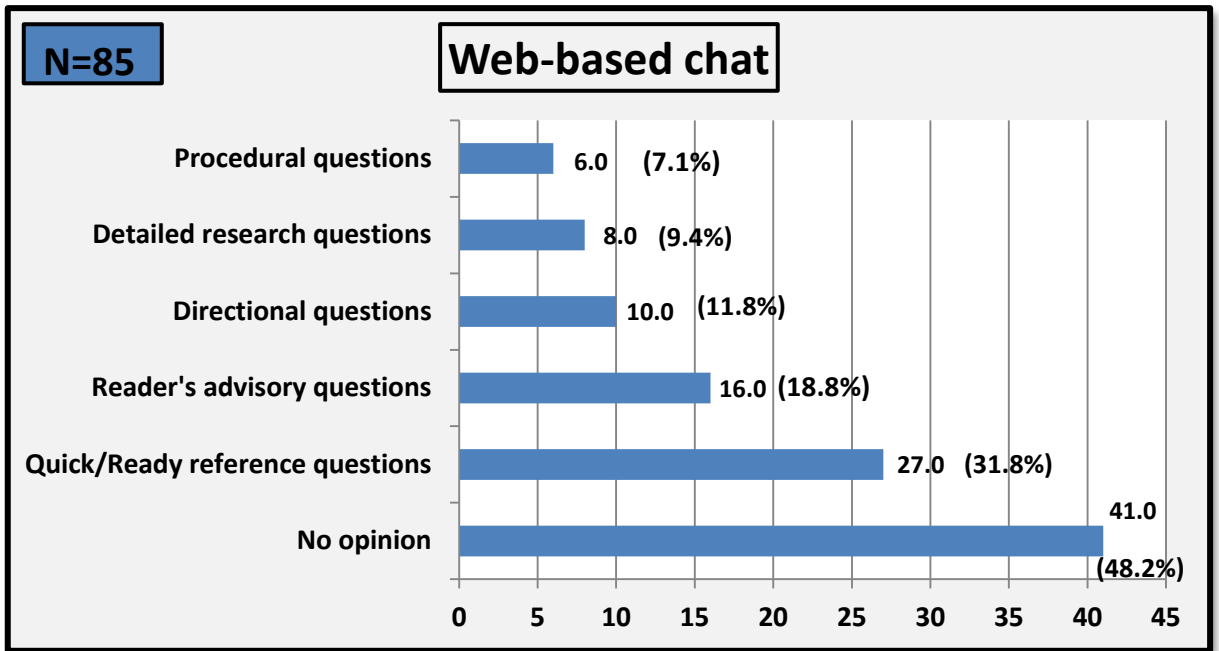


Figure 5.9: Respondents' opinions about web-based chat (N=85, multiple response)

5.2.5.2.5 Instant Messaging

The respondents' opinions about the suitability of instant messaging (IM) for answering various types of reference questions were explored. 29 (34.1%) respondents opined that IM is suitable for answering quick/ready reference questions, while 12 (14.1%) participants thought that reader's advisory

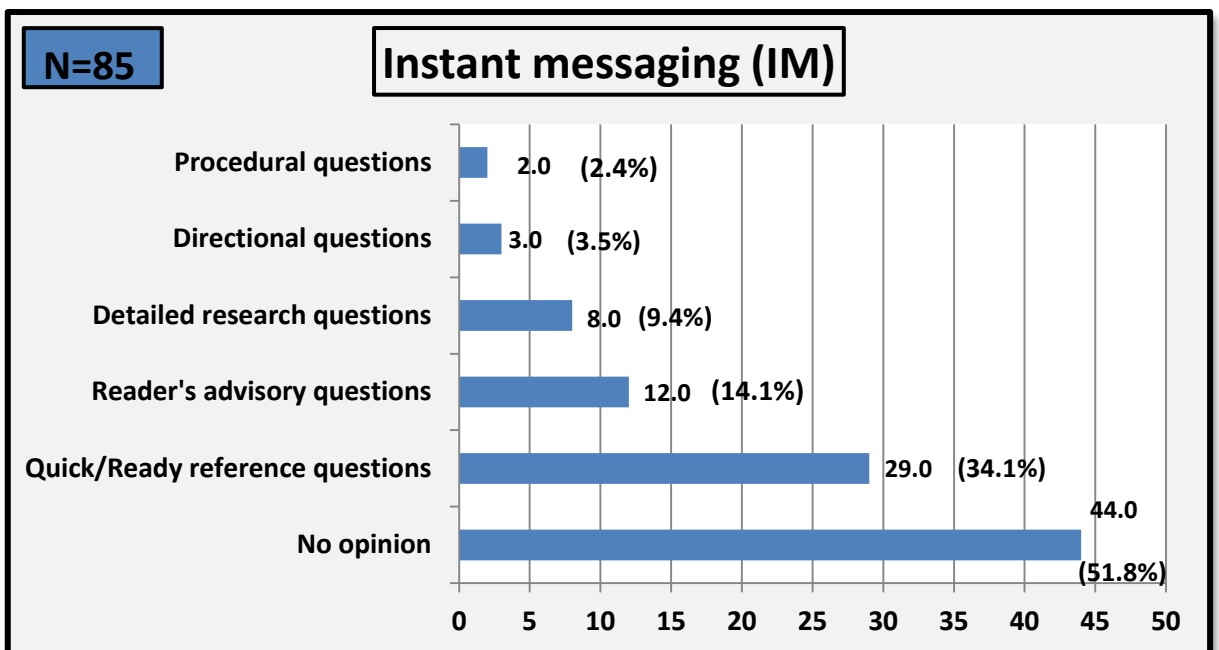


Figure 5.10: Respondents' opinions about IM (N=85, multiple response)

questions can be well answered through IM. The IM appeared to be a suitable means for handling detailed research questions to 8 (9.4%) participants. 3 (3.5%) respondents viewed the IM as a suitable medium for answering directional questions, whereas 2 (2.4%) respondents noted that procedural questions are answered in an efficient manner via IM. 44 (51.8%) respondents had no opinion about it (Figure 5.10).

5.2.5.2.6 Voice over Internet Protocol

Mixed opinions with regard to handling different categories of reference questions through Voice over Internet Protocol (VoIP) were received. 16 (18.8%) respondents thought that quick/ready reference questions are well served via VoIP, while 12 (14.1%) participants opined that detailed research questions can be handled in an efficient manner through VoIP. Another 12 (14.1%) respondents were of the view that VoIP is suitable for answering reader's advisory questions, whereas the VoIP appeared to be a suitable channel for answering directional questions to 7 (8.2%) respondents. 4 (4.7%) respondents noted that procedural questions can be well answered via VoIP, while 57 (67.1%) respondents did not give their opinions about it (Figure 5.11).

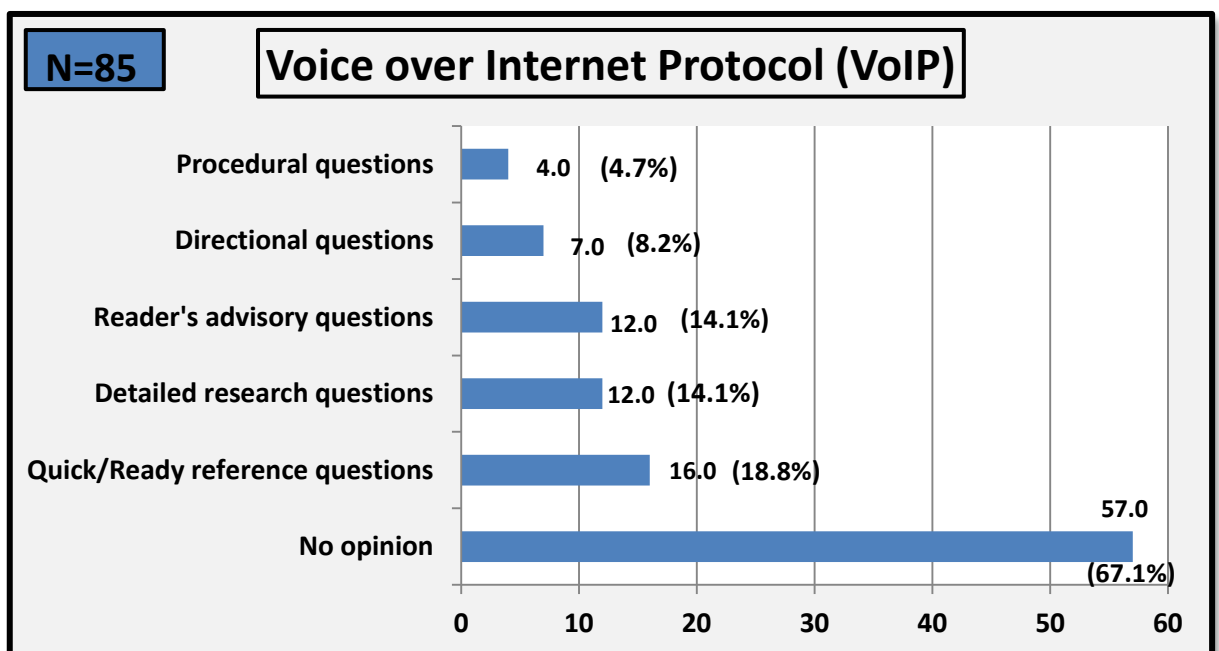


Figure 5.11: Respondents' opinions about VoIP (N=85, multiple response)

5.2.5.2.7 Video-conferencing

Respondents' opinions varied with regard to answering various types of reference questions through video-conferencing. 19 (22.4%) respondents were of the view that quick/ready reference questions are handled efficiently via video-conferencing, while 16 (18.8%) participants thought that detailed research questions are well served through video-conferencing. 12 (14.1%) participants viewed the video-conferencing as a suitable medium for answering reader's advisory questions, whereas 8 (9.4%) respondents noted that procedural questions can be well answered through video-conferencing. Video-conferencing appeared to be a suitable channel for handling directional questions to 4 (4.7%) respondents. 48 (56.5%) respondents did not express their opinions about it (Figure 5.12).

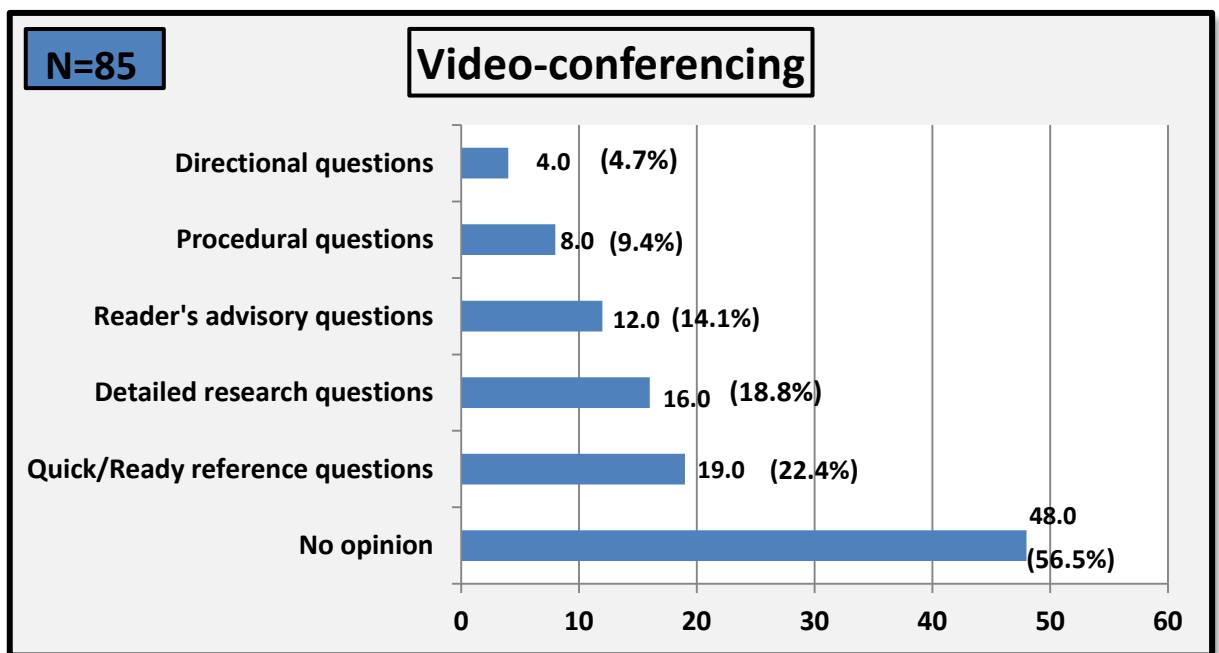


Figure 5.12: Respondents' opinions about video-conferencing (N=85, multiple response)

5.2.5.2.8 Collaborative Digital Reference

Respondents were divided in their opinions regarding the suitability of collaborative digital reference service (CDRS) for answering different categories of reference questions. 18 (21.2%) respondents opined that quick/ready reference questions are well served through CDRS, while another 18 (21.2%)

participants thought that CDRS is suitable for answering detailed research questions. The CDRS appeared to be a suitable channel/form for answering directional questions to 11 (12.9%) respondents, whereas 10 (11.8%) participants thought that it can handle reader's advisory questions in an effective manner. 5 (5.9%) respondents were of the view that procedural questions can be well served via CDRS, while 48 (56.5%) respondents had no opinion about it (Figure 5.13).

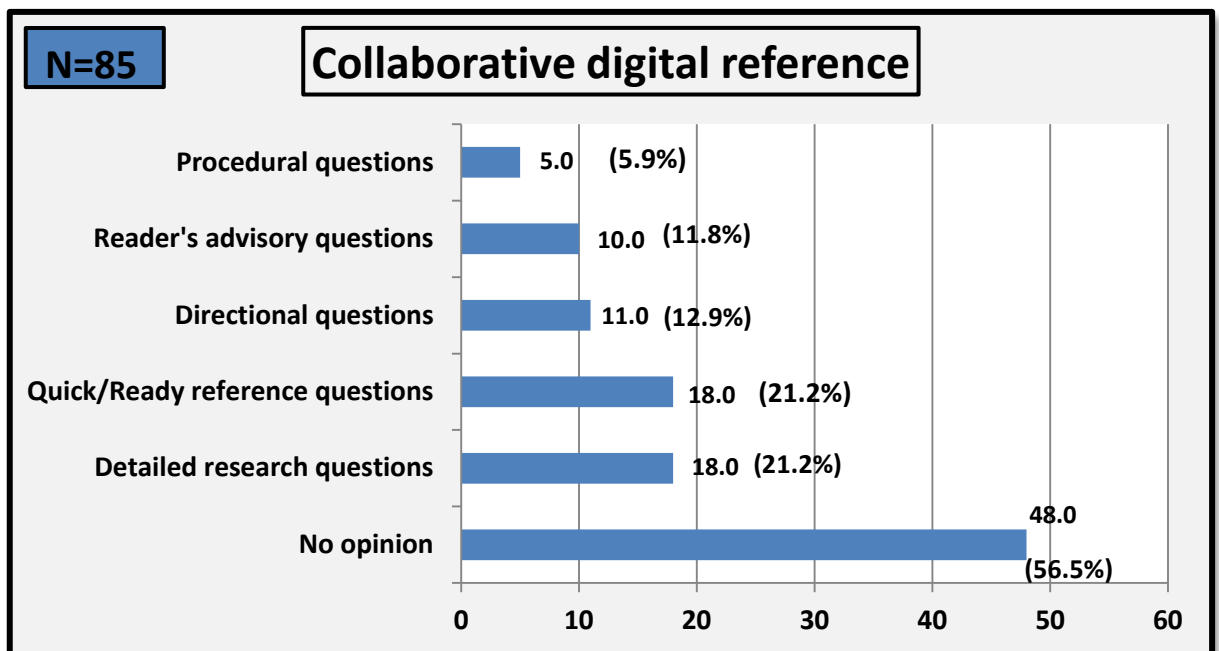


Figure 5.13: Respondents' opinions about CDRS (N=85, multiple response)

5.2.5.3 Benefits of DRS

The respondents were asked to give their opinions with regard to the benefits of DRS. They were asked to rate different statements using a five-point Likert scale (1=strongly disagree, 2=disagree, 3=no opinion, 4=agree, 5= strongly agree). The mean scores were calculated for each statement related to the benefit of the DRS in order to determine its rank (the higher the mean the higher the statement is rated). These statements are ranked and presented in Table 5.69.

Table 5.69: Respondents' opinions regarding benefits of DRS (N=85)

Statements		Strongly disagree	Disagree	No opinion	Agree	Strongly agree	Mean	SD	Rank
		N							
It provides answers to questions asked from any location at anytime	N	11	4	7	36	27	3.75	1.308	1
	%	12.9	4.7	8.2	42.4	31.8			
It saves time	N	16	1	4	32	32	3.74	1.457	2
	%	18.8	1.2	4.7	37.6	37.6			
It provides faster access to information	N	18	1	4	25	37	3.73	1.546	3
	%	21.2	1.2	4.7	29.4	43.5			
It is beneficial for particular users, e.g. distance learners, users with hearing and speaking impairments	N	14	1	7	36	27	3.72	1.368	4
	%	16.5	1.2	8.2	42.4	31.8			
It is convenient to offer to users	N	12	3	10	35	25	3.68	1.320	5
	%	14.1	3.5	11.8	41.2	29.4			
It allows staff to be physically flexible as they can answer queries from anywhere	N	11	4	9	39	22	3.67	1.276	6
	%	12.9	4.7	10.6	45.9	25.9			
It is easy to access as users need not come to library physically	N	13	2	10	37	23	3.65	1.325	7
	%	15.3	2.4	11.8	43.5	27.1			
It provides new options for answering reference questions	N	13	4	7	41	20	3.60	1.320	8
	%	15.3	4.7	8.2	48.2	23.5			
It is more efficient and cost-effective than traditional reference service	N	10	7	13	35	20	3.56	1.267	9
	%	11.8	8.2	15.3	41.2	23.5			
It provides opportunity for interactive learning	N	13	2	14	38	18	3.54	1.287	10
	%	15.3	2.4	16.5	44.7	21.2			
It feels like a live reference transaction	N	12	4	15	36	18	3.52	1.278	11
	%	14.1	4.7	17.6	42.4	21.2			
It helps to save chat session text which can be used later by both librarian and user	N	9	3	24	35	14	3.49	1.140	12
	%	10.6	3.5	28.2	41.2	16.5			
It extends service hours up to 24 hours a day, 7 days a week	N	15	6	9	33	22	3.48	1.411	13
	%	17.6	7.1	10.6	38.8	25.9			
It is more a personalised service	N	10	7	17	36	15	3.46	1.220	14
	%	11.8	8.2	20.0	42.4	17.6			
It motivates users to use library and its resources more effectively and efficiently	N	16	6	8	33	22	3.46	1.436	14
	%	18.8	7.1	9.4	38.8	25.9			
It helps to distribute workload among staff	N	9	11	13	38	14	3.44	1.219	15
	%	10.6	12.9	15.3	44.7	16.5			
It helps to provide a more complete answer to users	N	14	10	10	30	21	3.40	1.407	16
	%	16.5	11.8	11.8	35.3	24.7			

Statements	N	Strongly disagree	Disagree	No opinion	Agree	Strongly agree	Mean	SD	Rank
		14	6	16	36	13			
It gives more time for thought and reflection on part of librarian	%	16.5	7.1	18.8	42.4	15.3	3.33	1.295	17

The results, presented in Table 5.69, show an overall agreement among the respondents regarding the benefits of DRS. The respondents agreed that the DRS provides answers to questions asked from any location at any time (mean=3.75, rank 1), saves time (mean=3.74, rank 2), and provides faster access to information (mean=3.73, rank 3). As the DRS is provided over the Internet, it can be accessed from anywhere at any time. Users need not come to the library physically to access the service. It saves their time and provides them with faster access to required information. The respondents also agreed that the DRS is beneficial for particular users, e.g. distance learners, users with hearing and speaking impairments (mean=3.72, rank 4), and convenient to offer (mean=3.68, rank 5). The DRS is highly beneficial for distance learners as they can get their required information remotely through it. It is also useful for special users who have hearing or speaking disabilities as they can ask their questions through e-mail or text-based chat, and get their required information. Since e-mail reference does not require the reference librarian to engage in the reference interview with users, it is convenient to offer as compared to face-to-face reference, which may sometimes involve a long interaction with the users.

Respondents agreed that DRS allows reference staff to be physically flexible as they can answer queries from anywhere (mean 3.67=, rank 6), is easy to access by users (mean=3.65, rank 7), and provides new options for answering questions (mean= 3.60, rank 8). As the DRS is provided over the Internet, it is easy for the users to access and for the reference staff to offer. The users need not come to the library physically in order to ask their queries. Similarly, the reference staff are also not required to be physically available in the library for handling the service as they can provide answers to users' queries by getting access to the Internet from anywhere. The DRS provides the reference staff

with an opportunity to use various options/means, such as e-mail, IM, video-conferencing, VoIP, to provide answers to the users' queries.

The respondents were of the opinion that DRS is more efficient and cost-effective than traditional reference service (mean= 3.56, rank 9), provides opportunity for interactive learning (mean=3.54, rank 10), feels like a live reference transaction (mean=3.52, rank 11), and helps to save chat session text which can be used later by both the librarian and the user (mean=3.49, rank 12). E-mail reference helps to provide a more complete and clear answer as compared to that provided through face-to-face reference, as it gives more time for thought and reflection on part of the reference librarian. Moreover, e-mail reference provides answers in written form, which are less likely to be misunderstood. Using the Internet for providing reference assistance to remote users through various formats of the DRS is cheaper than using the telephone or mail. Reference transactions made through the synchronous DRS feel like live transactions, as it offers real time conversation or interview between the reference librarian and the remote user. Various software products used for IM/chat help to save chat session text which can be used later both by the reference librarian and the user. The respondents agreed that the DRS can extend service hours up to 24/7 (mean 3.48=, rank 13), is more a personalised service (mean= 3.46, rank 14), and motivates users to use the library and its resources more effectively and efficiently (mean= 3.46, rank 14). Depending upon a library's resources, the DRS can be offered 24/7. The DRS provides the opportunity to users, particularly those who are unable to visit the library, to use information resources of a particular library or a network of libraries.

The respondents were of the view that DRS helps to distribute workload among staff (mean= 3.44, rank 15), provides a more complete answer to users (mean= 3.40, rank 16), and gives more time for thought and reflection on part of librarian (mean= 3.33, rank 17). Depending upon availability of reference staff, some academic libraries assign the tasks of handling face-to-face and digital reference to separate reference staff, which helps to distribute the reference workload among the staff. E-mail reference provides the reference librarian with an opportunity to think about the question asked, assess the user's information

needs, search various information resources to find the required information, and provide the user with a more complete and thorough answer as compared to that offered through face-to-face encounter.

5.2.5.4 Limitations of DRS

The respondents' opinions with regard to limitations of DRS were sought. They were asked to rate various statements using a five-point Likert scale (1=strongly disagree, 2=disagree, 3=no opinion, 4=agree, 5= strongly agree). The mean scores were calculated for each statement related to the limitation of the DRS in order to determine its rank (the higher the mean the higher the statement is rated). These statements are ranked and presented in Table 5.70.

Table 5.70: Respondents' opinions regarding limitations of DRS (N=85)

Statements		Strongly disagree	Disagree	No opinion	Agree	Strongly agree	Mean	SD	Rank																																																																																																																												
It requires reference staff to be trained in the Internet and ICT skills	N	9	9	10	40	17	3.55	1.230	1																																																																																																																												
	%	10.6	10.6	11.8	47.1	20.0				It increases users' expectations as they wish to have instant and efficient response to their queries	N	10	12	14	36	13	3.35	1.241	2	%	11.8	14.1	16.5	42.4	15.3	It requires special infrastructure	N	10	14	15	33	13	3.29	1.252	3	%	11.8	16.5	17.6	38.8	15.3	It causes information overload	N	10	22	14	30	9	3.07	1.232	4	%	11.8	25.9	16.5	35.3	10.6	Complex queries cannot be answered satisfactorily or not at all through digital reference	N	10	21	15	32	7	3.06	1.199	5	%	11.8	24.7	17.6	37.6	8.2	It does not allow for non-verbal communication between user and librarian	N	10	25	16	27	7	2.95	1.194	6	%	11.8	29.4	18.8	31.8	8.2	It is more expensive than traditional reference service	N	9	26	19	24	7	2.93	1.163	7	%	10.6	30.6	22.4	28.2	8.2	It causes misinterpretation of things due to limited communication	N	10	22	22	28	3	2.91	1.098	8	%	11.8	25.9	25.9	32.9	3.5	It provides limited explanation to users	N	10	30	20	20	5	2.76	1.120	9	%	11.8
It increases users' expectations as they wish to have instant and efficient response to their queries	N	10	12	14	36	13	3.35	1.241	2																																																																																																																												
	%	11.8	14.1	16.5	42.4	15.3				It requires special infrastructure	N	10	14	15	33	13	3.29	1.252	3	%	11.8	16.5	17.6	38.8	15.3	It causes information overload	N	10	22	14	30	9	3.07	1.232	4	%	11.8	25.9	16.5	35.3	10.6	Complex queries cannot be answered satisfactorily or not at all through digital reference	N	10	21	15	32	7	3.06	1.199	5	%	11.8	24.7	17.6	37.6	8.2	It does not allow for non-verbal communication between user and librarian	N	10	25	16	27	7	2.95	1.194	6	%	11.8	29.4	18.8	31.8	8.2	It is more expensive than traditional reference service	N	9	26	19	24	7	2.93	1.163	7	%	10.6	30.6	22.4	28.2	8.2	It causes misinterpretation of things due to limited communication	N	10	22	22	28	3	2.91	1.098	8	%	11.8	25.9	25.9	32.9	3.5	It provides limited explanation to users	N	10	30	20	20	5	2.76	1.120	9	%	11.8	35.3	23.5	23.5	5.9												
It requires special infrastructure	N	10	14	15	33	13	3.29	1.252	3																																																																																																																												
	%	11.8	16.5	17.6	38.8	15.3				It causes information overload	N	10	22	14	30	9	3.07	1.232	4	%	11.8	25.9	16.5	35.3	10.6	Complex queries cannot be answered satisfactorily or not at all through digital reference	N	10	21	15	32	7	3.06	1.199	5	%	11.8	24.7	17.6	37.6	8.2	It does not allow for non-verbal communication between user and librarian	N	10	25	16	27	7	2.95	1.194	6	%	11.8	29.4	18.8	31.8	8.2	It is more expensive than traditional reference service	N	9	26	19	24	7	2.93	1.163	7	%	10.6	30.6	22.4	28.2	8.2	It causes misinterpretation of things due to limited communication	N	10	22	22	28	3	2.91	1.098	8	%	11.8	25.9	25.9	32.9	3.5	It provides limited explanation to users	N	10	30	20	20	5	2.76	1.120	9	%	11.8	35.3	23.5	23.5	5.9																												
It causes information overload	N	10	22	14	30	9	3.07	1.232	4																																																																																																																												
	%	11.8	25.9	16.5	35.3	10.6				Complex queries cannot be answered satisfactorily or not at all through digital reference	N	10	21	15	32	7	3.06	1.199	5	%	11.8	24.7	17.6	37.6	8.2	It does not allow for non-verbal communication between user and librarian	N	10	25	16	27	7	2.95	1.194	6	%	11.8	29.4	18.8	31.8	8.2	It is more expensive than traditional reference service	N	9	26	19	24	7	2.93	1.163	7	%	10.6	30.6	22.4	28.2	8.2	It causes misinterpretation of things due to limited communication	N	10	22	22	28	3	2.91	1.098	8	%	11.8	25.9	25.9	32.9	3.5	It provides limited explanation to users	N	10	30	20	20	5	2.76	1.120	9	%	11.8	35.3	23.5	23.5	5.9																																												
Complex queries cannot be answered satisfactorily or not at all through digital reference	N	10	21	15	32	7	3.06	1.199	5																																																																																																																												
	%	11.8	24.7	17.6	37.6	8.2				It does not allow for non-verbal communication between user and librarian	N	10	25	16	27	7	2.95	1.194	6	%	11.8	29.4	18.8	31.8	8.2	It is more expensive than traditional reference service	N	9	26	19	24	7	2.93	1.163	7	%	10.6	30.6	22.4	28.2	8.2	It causes misinterpretation of things due to limited communication	N	10	22	22	28	3	2.91	1.098	8	%	11.8	25.9	25.9	32.9	3.5	It provides limited explanation to users	N	10	30	20	20	5	2.76	1.120	9	%	11.8	35.3	23.5	23.5	5.9																																																												
It does not allow for non-verbal communication between user and librarian	N	10	25	16	27	7	2.95	1.194	6																																																																																																																												
	%	11.8	29.4	18.8	31.8	8.2				It is more expensive than traditional reference service	N	9	26	19	24	7	2.93	1.163	7	%	10.6	30.6	22.4	28.2	8.2	It causes misinterpretation of things due to limited communication	N	10	22	22	28	3	2.91	1.098	8	%	11.8	25.9	25.9	32.9	3.5	It provides limited explanation to users	N	10	30	20	20	5	2.76	1.120	9	%	11.8	35.3	23.5	23.5	5.9																																																																												
It is more expensive than traditional reference service	N	9	26	19	24	7	2.93	1.163	7																																																																																																																												
	%	10.6	30.6	22.4	28.2	8.2				It causes misinterpretation of things due to limited communication	N	10	22	22	28	3	2.91	1.098	8	%	11.8	25.9	25.9	32.9	3.5	It provides limited explanation to users	N	10	30	20	20	5	2.76	1.120	9	%	11.8	35.3	23.5	23.5	5.9																																																																																												
It causes misinterpretation of things due to limited communication	N	10	22	22	28	3	2.91	1.098	8																																																																																																																												
	%	11.8	25.9	25.9	32.9	3.5				It provides limited explanation to users	N	10	30	20	20	5	2.76	1.120	9	%	11.8	35.3	23.5	23.5	5.9																																																																																																												
It provides limited explanation to users	N	10	30	20	20	5	2.76	1.120	9																																																																																																																												
	%	11.8	35.3	23.5	23.5	5.9																																																																																																																															

Statements		Strongly disagree	Disagree	No opinion	Agree	Strongly agree	Mean	SD	Rank
	N								
It makes the reference interview difficult to conduct	N	10	33	15	22	5	2.75	1.143	10
	%	11.8	38.8	17.6	25.9	5.9			
It has increased the workload of reference staff	N	12	30	17	22	4	2.72	1.140	11
	%	14.1	35.3	20.0	25.9	4.7			
It makes users' information needs difficult to understand	N	10	30	22	21	2	2.71	1.045	12
	%	11.8	35.3	25.9	24.7	2.4			
It makes reference transactions impersonal	N	13	27	25	16	4	2.66	1.097	13
	%	15.3	31.8	29.4	18.8	4.7			
It is difficult to offer to users	N	15	38	8	22	2	2.51	1.130	14
	%	17.6	44.7	9.4	25.9	2.4			
It takes longer time to handle a reference transaction	N	15	40	13	16	1	2.39	1.025	15
	%	17.6	47.1	15.3	18.8	1.2			

As shown in Table 5.70, the respondents agreed that DRS requires reference staff to be trained to provide the service (mean= 3.55, rank1), increases users' expectations of having a quick response to their queries (mean= 3.35, rank 2), and requires special infrastructure (mean=3.29, rank 3). The reference staff handling the DRS need to be trained in skills of the DRS in order to manage the service. They cannot operate the service efficiently unless they are properly trained in specific skills. The DRS has created a sense of urgency among users. The users expect an urgent response to their queries. E-mail reference takes some time to respond to the users' queries, which may cause the users' dissatisfaction with the service. The libraries need to be equipped with necessary ICT infrastructure in order to develop the DRS. No library can launch the service without the provision of the required ICT infrastructure. The respondents were of the opinion that the DRS causes information overload (mean=3.07, rank 4). The users may have access to a variety of electronic and web-based information resources through the DRS, which may cause information overload. The reference librarian needs to provide specific information to users in order to avoid information overload.

The respondents were of the view that complex queries cannot be answered satisfactorily or not at all through DRS (mean=3.06, rank 5). The reference librarian may feel difficulty in understanding complex queries asked through e-mail reference due to limited communication. But various formats of the synchronous DRS allow the reference librarian to conduct the reference interview to get the user's information need clarified, thus helping him to deal with complex queries effectively. The respondents were of the opinion that the DRS does not allow for non-verbal communication between the user and the librarian (mean=2.95, rank 6), is more expensive than traditional reference service (mean= 2.93, rank 7), causes misinterpretation of things due to limited communication (mean= 2.91, rank 8), and provides limited explanation to users (mean=2.76, rank 9). E-mail and chat reference do not allow for non-verbal communication between the user and the reference librarian, but video reference helps the reference librarian to observe the user's body language in order to understand his information needs. E-mail reference may cause misinterpretation of things and provide limited explanation to users due to the asynchronous nature of the interaction, but various forms of the synchronous DRS help the reference librarian to understand the users' requirements and explain things explicitly to them during live interaction.

The respondents thought that DRS makes the reference interview difficult to conduct (mean=2.75, rank 10), increases the workload of reference staff (mean=2.72, rank 11), and makes users' information needs difficult to understand (mean=2.71, rank 12). Trained reference staff can conduct the reference interview through chat/IM reference effectively. Moreover, video reference provides the reference librarian with an opportunity to conduct a live reference interview in which he can observe the user's physical cues to understand his information needs. The task of the DRS should not be considered as an add-on duty, rather it should be incorporated in the workload of the reference staff. Moreover, depending upon availability of the reference staff in the library, the tasks of the DRS and face-to-face reference may be assigned to separate reference staff.

The respondents were of the view that DRS makes reference transactions impersonal (mean=2.66, rank 13), is difficult to offer to users (mean=2.51, rank 14), and takes a longer time to handle a reference transaction (mean=2.39, rank 15). Reference staff may feel difficulty in handling the DRS, if they are not properly trained in skills of the DRS. However, skilled staff can easily manage the service. E-mail reference takes a longer time to handle a reference transaction due to the asynchronous nature of communication, but chat/IM reference and video reference help to deal with users' queries quickly.

5.2.6 Issues affecting Implementation and Management of DRS

This section aims to explore issues which affected the implementation and management of DRS in participant libraries. The respondents were asked to indicate the extent of various issues using a five-point Likert scale (1= not at all, 2=minor extent, 3=undecided, 4=moderate extent, 5=major extent). The mean scores were calculated for each issue in order to determine the extent of its effect on the implementation and management of the DRS in the participant libraries (the higher the mean the higher the extent of effect of an issue is rated). All these issues are ranked and presented in Table 5.71.

Table 5.71: Issues affecting implementation and management of DRS in libraries (N=85)

(*Ranking scale: 1=issue having most effect; 13=issue having least effect)

Statements		Not at all	Minor extent	Undecided	Moderate extent	Major extent	Mean	SD	Rank
		N							
Power crisis in the country	N	11	12	10	12	40	3.68	1.498	1
	%	12.9	14.1	11.8	14.1	47.1			
Lack of research and literature in this area in the country	N	8	20	13	20	24	3.38	1.363	2
	%	9.4	23.5	15.3	23.5	28.2			
Lack of training facilities for library professionals in the country	N	12	17	10	19	27	3.38	1.464	2
	%	14.1	20.0	11.8	22.4	31.8			
Unavailability of suitable software for digital reference	N	10	16	16	19	24	3.36	1.379	3
	%	11.8	18.8	18.8	22.4	28.2			
Absence of a policy regarding digital reference service in library	N	10	21	14	15	25	3.28	1.419	4
	%	11.8	24.7	16.5	17.6	29.4			
Financial constraints	N	11	24	8	17	25	3.25	1.463	5
	%	12.9	28.2	9.4	20.0	29.4			
Low speed of the Internet in the country	N	14	23	8	14	26	3.18	1.521	6
	%	16.5	27.1	9.4	16.5	30.6			
Shortage of competent and skilled library professionals	N	17	19	8	11	30	3.21	1.597	7
	%	20.0	22.4	9.4	12.9	35.3			
Lack of ICT application	N	18	13	12	21	21	3.16	1.495	8
	%	21.2	15.3	14.1	24.7	24.7			
Lack of resources	N	17	19	6	19	24	3.16	1.542	8
	%	20.0	22.4	7.1	22.4	28.2			
Shortage of digital library collection	N	14	18	12	23	18	3.15	1.410	9
	%	16.5	21.2	14.1	27.1	21.2			
Lack of ICT facilities	N	19	17	8	16	25	3.13	1.572	10
	%	22.4	20.0	9.4	18.8	29.4			
Inadequate physical facilities	N	15	20	13	18	19	3.07	1.437	11
	%	17.6	23.5	15.3	21.2	22.4			
Lack of interest on part of library staff	N	16	22	13	15	19	2.99	1.452	12
	%	18.8	25.9	15.3	17.6	22.4			
Lack of planning	N	19	22	13	19	12	2.80	1.387	13
	%	22.4	25.9	15.3	22.4	14.1			

As shown in Table 5.71, the respondents perceived the electric energy crisis in the country as the most important issue (mean=3.68, rank 1), which negatively affected them to implement and manage DRS in their respective libraries. The

lack of research and literature on the DRS in the country was viewed by the respondents as the second most important factor (mean=3.38, rank 2), which had a negative effect on effective implementation and management of the service in their libraries. The respondents also considered the lack of training facilities for LIS professionals in the country to be the second most important factor (mean=3.38, rank 2), which hindered them in introducing and managing the DRS effectively in their libraries. LIS professionals need to be trained on a regular basis in order to keep them up to date with the latest professional knowledge and developments. The findings from this research and the literature show that there is a lack of continuing professional development courses for LIS professionals in the country, which impacts on the development of their professional competencies. The absence of suitable software for the DRS was viewed by the respondents as the third factor (mean=3.36), which prevented them from developing and managing the service effectively. Software vendors have designed library-specific software products for the DRS, which facilitate the provision of the service in an effective manner. The findings of this research show that no such software product was used by any of the libraries to offer the service.

The absence of a digital reference policy was ranked by the respondents as the fourth factor (mean=3.28) in terms of its having negative effect on the implementation and management of DRS in their respective libraries. Academic libraries require adequate funds to acquire necessary resources to initiate and manage different services. Financial constraints facing most of the academic libraries in the country prevent them from introducing new library services. The respondents perceived the financial constraints as the fifth issue (mean=3.25), which negatively affected their libraries to develop and run the DRS.

The Internet is one of the basic requirements for DRS. The speed of the Internet is an important factor in providing quality DRS. The low speed of the Internet was viewed by the respondents as the sixth factor (mean=3.18) in terms of its negative effect on effective implementation and management of the DRS in their respective libraries. Respondents perceived the shortage of competent

and skilled LIS professionals as the seventh issue (mean= 3.21), which affected the implementation and management of DRS in their libraries.

Library automation plays an important role in information acquisition, organisation, retrieval and dissemination. In Pakistan, some academic libraries have been fully automated, while there are a number of academic libraries in which automation is under process. The respondents considered the lack of automation to be the eighth factor (mean= 3.16), which prevented them from developing and managing DRS. Adequate resources are required to develop and run DRS in academic libraries. The lack of necessary resources in the libraries was also ranked by the respondents as the eighth factor (mean=3.16), which had a negative effect on the implementation and management of DRS in their respective libraries.

Other factors which affected the implementation and management of DRS in academic libraries include: shortage of electronic resources (mean=3.15), lack of ICT facilities (mean=3.13, rank 10); inadequate physical facilities (mean=3.07, rank 11); lack of interest on part of library staff (mean=2.99, rank 12); and lack of planning (mean=2.80, rank 13).

5.3 Summary

The quantitative results indicate that almost all participant libraries provided reference services to users. Libraries employed traditional delivery channels, i.e. face-to-face consultation, telephone, fax, mail, to offer reference services. All the libraries held reference collections in print form, while nearly three-quarters of the libraries had reference materials in electronic form. Nearly forty percent of the libraries had employed reference staff (both professional and para-professional) and set up a reference desk for the provision of reference services. The findings suggest that DRS is at a developing stage in academic libraries, with twenty one percent of the libraries offering the service. It was found that most of the libraries offered asynchronous DRS through e-mail and web forms, while only two libraries provided synchronous DRS using web-based chat and instant messaging. The reference staff in most of the libraries

(12) handled DRS, while eight libraries had deputed separate staff to manage the service. A number of issues facing academic libraries in implementing and managing DRS were identified. The quantitative results are discussed in detail along with the qualitative results obtained through semi-structured interviews in chapter 7.

Chapter 6: Interview Analysis

6.1 Introduction

Semi-structured interviews were conducted to collect qualitative data to supplement the quantitative data collected through the questionnaire survey for the research study. The face-to-face semi-structured interviews were carried out to explore the points of view and attitudes of the participants on reference services in academic libraries in Pakistan. The interviews aimed to obtain a clear picture about the current situation of the implementation and management of DRS, and issues and problems affecting the implementation and management of DRS in academic libraries. The interviews were also used to obtain the participants' opinions on the future development of DRS, and to identify factors contributing to the development of DRS in academic libraries. The interviews also intended to explore participants' views on prospects for collaboration among academic libraries to provide DRS.

A total of fifteen interviews with the heads of leading academic libraries offering DRS, both in the public and private sectors, in Pakistan were conducted (see Appendix G). A thematic approach was used to analyse the qualitative data gathered through the interviews in order to present the participants' views and explanations of different issues pertaining to the research study. The data collected through the interviews are analysed and interpreted according to themes and sub-themes, which have emerged.

6.2 Reference Services

All interviewees, both in the public and private sectors, regarded the reference service as a very important library service in academic libraries. The interviewees were of the view that no academic library is complete without a reference service. One interviewee believed that, after circulation, the reference service shows the performance of an academic library as it facilitates users in

using the library and its resources, thus increasing the usage of the library and its resources. Two of the interviewees commented:

“It (reference service) has great importance in academic libraries of Pakistan [...]”¹. If we have expert reference librarians in our academic libraries, they can be very useful and they can enhance the library usage. They have key importance in dealing with small queries to research activities in academic libraries of Pakistan.” (Public sector librarian)

“Actually, in academic libraries in Pakistan or anywhere no services are complete without reference services, because we say resources are useless without services, the reference service is the most important service in the library, and services are hollow without resources. So, these two complement each other. They are required for each other. So, I give very high importance to reference services in academic libraries.” (Private sector librarian)

The majority of the interviewees were of the opinion that most users cannot find their required information in academic libraries as they are not fully aware of the libraries and their resources. Users need assistance in searching for their required information. The reference service helps to familiarise them with the library and its resources. It provides guidance to them in using library resources, and facilitates them in finding their required information from a plethora of resources, both in print and electronic forms, available in the academic libraries. Comments of two of the interviewees illustrate this:

“The basic purpose of reference services is to facilitate users in accessing their required information. Information is now available in a variety of resources such as printed books, e-books, e-journals, databases, etc. So, the function of reference services is to fulfill users’ information needs by searching and obtaining required information from any of these resources.” (Public sector librarian)

“[...] he (user) does not know where from he will get his required information. In that case, library staff guide him from which

¹ An ellipsis in square brackets [...] here and subsequently indicates that a piece of interview text has been omitted from the quote.

source reliable, authentic and latest information about his research can be obtained.” (Private sector librarian)

A number of interviewees were of the view that students need reference services in order to prepare their assignments, reports, projects and theses in academic libraries. Reference staff help them to find their required information from different library resources to complete their academic work in time. Some interviewees believed that the number of reference queries received from postgraduate students was higher than that of undergraduate students in the academic libraries. One interviewee was of the opinion that undergraduate students cannot search their required information on their own in the academic libraries, while postgraduate students are somewhat capable of finding required information from library resources. He believed that students at any level require reference services in order to complete their assignments on a given deadline. Two of the interviewees commented:

“With the introduction of a semester system in most of the academic institutions in Pakistan, the usage of reference services has increased as students have to ask a lot queries to prepare their assignments and reports.” (Public sector librarian)

“Since courses on different subjects are offered in academic institutes, the range of users’ needs is vast in academic libraries. [...] They come to library to prepare their assignments. They don’t know where they can get their required information from. [...] Reference librarian guides them from which resource they can get their required information.” (Private sector librarian)

As one of the basic functions of universities is to conduct research in different fields, academic libraries are supposed to facilitate the researchers by providing them with the latest and authoritative information in their fields. The majority of the interviewees were of the opinion that research cannot be conducted without the provision of reference services in academic libraries. One interviewee believed that since researchers have limited time to conduct research, reference services save their time by providing them with the accurate information within the possible shortest time. He further added that reference services provide

guidance to researchers in managing references and bibliographies for their research work. Others commented:

“Researchers will face problems in conducting research: if they are not given proper guidance regarding the use of reference resources especially electronic reference resources; if they are not guided about which are authentic resources; if they are not guided how to get information from the electronic resources and how to find information from printed material; and if they are not guided how to evaluate the authentic information.” (Public sector librarian)

“Library staff guide him (user) from which source reliable, authentic and latest information about his research can be obtained.”(Private sector librarian)

Some interviewees pointed out that the usage of reference services was low in academic libraries as users were not aware of reference services and resources available in the libraries. Users themselves tried to find their information from the Internet and different resources available in academic libraries. In order to make users aware of reference services and resources, one interviewee suggested that the concept of reference services and resources should be introduced to users in academic libraries.

Academic libraries require the latest reference and information resources in various important fields in order to provide reference and information services. One library head complained about a shortage of reference resources on national affairs in academic libraries of the country, which made it difficult for library staff to provide answers to reference queries pertaining to national issues. Another library head believed that the reference resources in the private sector academic libraries were better than those of the public sector academic libraries.

In Pakistan, nine library schools impart LIS education at undergraduate and postgraduate levels (see section 3.4). One interviewee stated that students were not taught the latest techniques and methods of reference services in the country's library schools. He suggested that the library schools should incorporate some of the latest books on reference services in their courses so

that students can learn the latest techniques and methods of reference services, and after graduating from the schools they can implement and manage reference services efficiently in the libraries they join.

One interviewee stated that reference services were practised in a few academic libraries in the country in the past. But with the introduction of the Internet and electronic resources, a number of academic libraries have started offering reference services. He added:

“We studied about reference service in library schools but we didn’t see the reference service in the true sense in academic libraries of Pakistan. Academically, that was there as we taught about the reference service and reference sources in library schools but practically it was implemented in a few academic libraries in Pakistan. A few years back, when there were only print sources, and the reference service was provided manually (face- to- face), it (reference service) was not practised extensively in libraries. But with the advent of electronic resources and the Internet, this service has been improved and more and more academic libraries in Pakistan are implementing it.” (Private sector librarian)

One library head was of the opinion that the Internet has decreased the usage of reference services in academic libraries as users consult the Internet for their queries. He believed that the academic libraries need to compete with the Internet in order to increase the usage of reference services. Another library head was of the view that the introduction of ICT has necessitated the provision of reference services through the Internet (DRS) in the academic libraries because users expect their information needs to be fulfilled quickly. Some interviewees suggested that the academic libraries should improve the quality of the reference services and start to provide DRS to users in order to ensure the users’ satisfaction and increase the usage of the service.

6.2.1 Instruction

Instruction is considered a main component of reference services in almost all types of libraries. Instruction is carried out with individual library users as well as users’ groups. A number of interviewees mentioned that they provided

instruction as a part of reference services to their library users. Academic libraries use a number of methods, such as orientation tours, library guides and handouts, information literacy sessions, audiovisual presentations, in order to impart instruction to users. A number of interviewees indicated that they arranged general orientation for new intakes of students at the beginning of each academic session. Users were familiarised with library resources and services, library rules and regulations, and they were instructed how to use different information resources and how to access different library services during these orientation programs. Two interviewees commented:

“We provide the orientation to our users when they join the university. One orientation, which is based on the introduction of library, is conducted in the library. [...] In another orientation program, I myself and my all librarians are invited by all departments of the university to introduce services of the library to postgraduate students.” (Public sector librarian)

“We inform the new intake about library services in orientation.” (Private sector librarian)

Heads of some academic libraries in the public sector said that they arranged audiovisual presentations in their libraries in order to make library users aware of library services and resources, library rules and regulations, and guide them how to use information resources (both printed and electronic). One library head said:

“We arrange an audiovisual presentation on library rules and regulations, policies, procedures, library resources, fresh arrivals and library events in our reference section.” (Public sector librarian)

Some interviewees reported that they provided printed library guides and brochures to users in order to introduce library services and resources, and library rules and regulations. Some other interviewees stated that they conducted information literacy sessions for the users in order to train them to use library resources, as two of them commented:

“We provide hands-on training to undergraduate and postgraduate students in the library in which they are instructed how to access digital resources and how to use the digital library.” (Public sector librarian)

“We go beyond the library to provide reference services to our users, like we have a full-fledged information literacy program in which users are trained how to use databases and library stuff. On database we held 29 workshops to provide training to our students and faculty last year. Then, we subscribed to JSTOR and launched it properly. We also held a workshop on it to train our users how to use it”. (Private sector librarian)

6.2.2 Reference Staff

Trained and skilled reference staff are necessary to provide efficient reference services to users in academic libraries. Academic libraries hire and train reference staff in order to handle reference services. The importance of reference staff was realised by the interviewees as a number of interviewees reported that they had employed reference staff, both professional and paraprofessional, in their respective libraries. Two of the interviewees stated:

“We have five reference staff members working in our library. Out of these five reference staff members, two staff members are professional, while three members are paraprofessional.” (Public sector librarian)

“We have a qualified designated reference librarian in our library. He is a highly skilled and highly paid librarian among our staff. He deals with all types of reference queries, both manual and electronic.” (Private sector librarian)

Heads of some academic libraries in the public sector said that although they did not have reference staff, they had deputed some other staff members to manage reference services in their libraries. For example,

“Currently, we don’t have a designated reference librarian in our library. The incharge of circulation section has been made responsible for dealing with general reference queries at circulation desk in our library. He answers all general reference queries at the circulation desk.” (Public sector librarian)

In some public sector academic libraries, library heads also handled complex reference queries, as one of them acknowledged:

“Complex reference queries, such as queries related to the usage of electronic resources, and EndNote software for managing references and bibliographies, asked by researchers, students and faculty members are dealt with and answered by myself (library head).”
(Public sector librarian)

6.2.3 Reference Desk

Academic libraries set up a reference desk in order to provide reference services to users. The reference desk is staffed by a trained reference librarian who provides answers to users' queries and assists the users in using library services and resources. The reference librarian working at the reference desk usually provides reference services to users through face-to-face consultation. He may also use other means, such as telephone, fax to offer the service or may handle DRS at the reference desk. A number of interviewees stated that they had set up a reference desk in their libraries, as two of them commented:

“We have four reference desks in our three libraries. We have three libraries in our university. Two libraries have one reference desk each, while one postgraduate library has two reference desks.” (Public sector librarian)

“First of all we provide reference services through face-to-face consultation. For this we have a Reference cum Help Desk in our library.” (Private sector librarian)

Depending upon resources, some academic libraries set up a separate reference section equipped with a variety of reference and information resources, and staffed by skilled reference staff for providing reference services. Library heads of some large public sector academic libraries pointed out that they had set up a separate reference section which had good reference

collections (both in print and electronic forms) and designated reference staff for the provision of reference services. One of these library heads said:

“We have a separate reference section which is in the charge of a reference librarian in our library.” (Public sector librarian)

6.2.4 Access to Reference Services

Interviewees were asked to mention the delivery channels they used to provide reference services. One of the interviewees commented that, *“it depends upon how the environment of the institution is,”* to adopt a certain means to offer reference services. She was of the opinion that if students and faculty members of an institution are conversant with ICT, and they and the academic library have good ICT facilities, then reference services should be provided through electronic means. On the other hand, if students and teachers of an institution are not familiar with ICT, and they and the academic library lack ICT facilities, then traditional channels should be used for the provision of reference services. Another interviewee opined that the academic libraries should keep in view the situation in Pakistan while adopting certain means to provide reference services, as he said:

“Keeping in view the scenario of Pakistan, we have opted for both manual and electronic methods to provide reference services to our users.” (Public sector librarian)

All interviewees reported that they had adopted a combination of both traditional and electronic means to offer reference services. They were of the view that since a number of students were not fully conversant with ICT skills in higher education sector of the country, they provided reference services through both traditional and electronic means so that all types of users could access the service. All the interviewees reported that they used face-to-face consultation and telephone to provide reference services. All the interviewees pointed out that they also offered DRS. The interviewees commented:

“Two methods, face-to-face consultation and e-mail, are mainly used by users to obtain reference services in our library. We mostly receive

queries regarding availability of resources and some complaints via e-mail.”(Public sector librarian)

“Currently, we use face-to-face consultation, e-mail, telephone and web chat to provide reference services to users.”(Private sector librarian)

“We provide reference services through face-to-face meeting, ask a librarian (web-form reference) and telephone. Through “ask a librarian service” we not only answer users’ general queries but also entertain their article requests.” (Private sector librarian)

6.2.4.1 Users’ Preferences

Interviewees were asked to state which channel was mostly used by users to ask reference queries in their respective libraries. All the interviewees reported that the majority of users asked queries through face-to-face consultation in their libraries. The interviewees pointed out that the usage of DRS was low than that of face-to-face reference due to a number of reasons, such as users’ unawareness of DRS, users’ inability to clarify their questions through DRS, users’ dissatisfaction with the service, lack of ICT skills among users, scarcity of ICT facilities available with users. Regarding this, two interviewees remarked:

“Users mostly use face-to-face consultation to ask their reference queries in our library. But when they visit the reference desk to ask their queries through face-to-face consultation they come to know that they can also use other method.” (Public sector librarian)

“Students prefer to ask their queries through face-to-face consultation, and for that they visit the library and consult the reference librarian at the reference desk.” (Private sector librarian)

The majority of the interviewees stated that after face-to-face consultation, asynchronous DRS was mostly used by users for asking reference questions in their libraries. The interviewees added:

“Users mostly ask their queries through face-to-face consultation in our library. After face-to-face consultation, e-mail and then telephone is used by the users for asking the queries.” (Public sector librarian)

“Two major methods, first face-to-face consultation and then “ask a librarian” (web form-based DRS), are mostly used for reference services in our library.” (Private sector librarian)

Heads of two academic libraries offering synchronous DRS stated that the synchronous DRS had not yet become popular among users, and it was not extensively used by the users. They added that as the service was being offered only during library working hours, the users did not tend to use it because of this time restriction, as one of them said:

“[...] chat room is not too busy at the moment because they (users) have to follow the time slots for it and users might not be available at that time. That’s why, it has not yet become very much popular among users.” (Private sector librarian)

All interviewees ranked the telephone third in terms of its usage for seeking assistance in their respective libraries. Some interviewees stated that the usage of a certain means for seeking assistance depended upon the type of users. They pointed out that faculty members and research students mostly asked queries through DRS, whereas students of bachelor’s and master’s degree programmes preferred to ask queries at the reference desk through face-to-face meetings. It could be due to the reason that the faculty members and research students have better ICT facilities, and are more skilled in ICT than bachelor’s and master’s students in higher education institutions of the country.

6.3 Digital Reference Services

All interviewees pointed out that their libraries provided asynchronous DRS (nine through e-mail and six via web forms). Whereas, only two interviewees reported that they had developed synchronous digital reference systems by employing IM and web chat. Interviewees commented:

“We adopt face-to-face consultation, e-mail and instant messaging to provide reference services to users. We provide a form to users and ask them to fill in their queries along with their e-mail addresses. We send required information to users via e-mail later on. We have also provided library e-mail address on our library website. Users also send

their queries through it. The usage of instant messaging is low in our library.”(Public sector librarian)

“Currently, we offer reference services through face-to-face consultation, e-mail, telephone and web chat. We receive a lot of queries through e-mail and telephone but the chat room is not too busy at the moment because they (users) have to follow the time slots for it, and users might not be available at that time. That’s why, it has not yet become much popular among users.”(Private sector librarian)

Heads of some academic libraries in the public sector reported that they were providing a selective dissemination of information service as a part of DRS, as one of these library heads said:

“We are providing a SDI service to PhD and M Phil students and faculty members. We provide scanned copies of tables of contents of journals, which we are subscribing for our library, to PhD and M Phil students, and faculty members through e-mail. If any user asks for any article we provide him a scanned copy of that article through e-mail.”(Public sector librarian)

Heads of some academic libraries, both in the public and private sectors, pointed out that they provided an electronic document delivery service as a part of DRS. Two of these library heads stated:

“[...] Heads of departments request the library to provide their required documents and the library provides the required documents via e-mail.”(Public sector librarian)

“We provide electronic document delivery service via e-mail to users. Users send us requests for their required e-documents via e-mail and we provide them with the documents through e-mail.”(Private sector librarian)

6.3.1 Policy and Guidelines for DRS

Academic libraries need to formulate a policy in order to implement and manage DRS effectively. The policy helps to clarify the parameters of service, service behaviours, service standards, response time, guidelines and benchmarks for the quality of the service. Interviewees were asked if they had devised a policy for DRS, and whether they followed any guidelines to implement and manage

DRS in their respective libraries. The majority of the interviewees reported that they had not devised a formal digital reference policy. As regards guidelines for DRS, all the interviews stated that they did not follow any guidelines for implementation and management of the DRS in their libraries. Two of the interviewees remarked:

“No, we don’t have any specific, clear-cut, written policy for the provision of digital reference services. But, being a librarian, I think that we should provide digital reference services.” (Public sector librarian)

“We don’t follow any formal written policy or guidelines to provide digital reference services in our library.”(Private sector librarian)

The head of an academic library in private sector said that although his library did not have a formal policy for DRS, it followed some informal guidelines for the provision of the service. He added:

“We don’t have a formal written policy as yet, but there are some unwritten guidelines which we follow to provide digital reference services. We have made a flow-chart which guides us how to provide required information to users if they have requested it through e-mail.” (Private sector librarian)

6.3.2 Maintenance of ICT Infrastructure for DRS

Academic libraries need to be equipped with effective ICT infrastructure in order to implement and manage DRS. Interviewees were asked how they maintained the ICT infrastructure used for the DRS in their respective libraries. A number of interviewees reported that the overall ICT infrastructure of their libraries was maintained by IT departments of their institutions. Interviewees stated that whenever they faced any problem in their libraries’ ICT infrastructure they called the IT experts from IT departments who resolved it. For example:

“There is a separate section called ICT Division in our institute which maintains ICT infrastructure of our library. If we face any problem in our ICT infrastructure we call ICT experts from this division and they resolve the problem.”(Public sector librarian)

“At the moment, ICT infrastructure of our library is maintained by ICT department of the university. But, in the future, we plan to hire our own ICT expert.”(Private sector librarian)

Heads of some academic libraries pointed out that their library staff performed some minor tasks related to maintenance of ICT infrastructure in their respective libraries.

“Some simple tasks related to maintenance of ICT infrastructure, for example, networking or setting up e-mail groups or any task related to hardware, are performed by our library staff.”(Public sector librarian)

“The main ICT infrastructure of library is maintained by ICT experts from the Office of Information Technology in the university. Some minor work is done by the library staff who have their ICT background.”(Private sector librarian)

Heads of large academic libraries reported that they had set up separate IT sections in their libraries, which were staffed by IT professionals including an IT administrator, network administrators, computer programmers, etc. The IT professionals of the IT sections were responsible for the maintenance of their libraries' overall ICT infrastructure. A head of one of these libraries noted:

“We have five ICT staff members, including an ICT administrator and a network administrator in our library, who maintain ICT infrastructure of our library.”(Public sector librarian)

6.3.3 Staff Training

Reference staff need to be trained before they are assigned duties of handling DRS in a library. They need to be trained in ICT skills, and made conversant with the software product used for the DRS. They are also required to be trained how to interact with users and how to provide answers to users' queries through different formats of the DRS. Interviewees were asked if they provided training to their reference staff for handling the DRS. A number of interviewees reported that they provided in-house training to the reference staff for operating the service. The training was given to the reference staff by library heads and library's IT professionals. The reference staff were trained how to handle

different formats of the DRS. They were also given training in ICT skills. For example:

“Yes, in-house formal training is provided to reference staff for handling digital reference services in our library. We train our reference staff how to answer a query via e-mail.”(Public sector librarian)

“Yes, we do provide training to reference staff to handle digital reference queries. I train them how to reply in the chat, what language and wording to use in the chat in order to provide answers to users’ queries. In some cases, I have standardised messages. The reference staff just copy these messages to send required information e.g. articles, to users. The staff are also trained to answer telephone queries.”(Private sector librarian)

Some interviewees pointed out that besides giving internal training in DRS to their reference staff, they sent the reference staff to attend training courses on ICT organised by library organisations and the HEC in the country. These training courses helped the reference staff to improve their ICT skills, thus enabling them to manage the DRS effectively. One interviewee stated that his library organised e-resources’ vendors training sessions in order to train the library staff to use the e-resources efficiently. Such interviewees remarked:

“Our reference staff who handle digital reference services receive training in the use of e-resources organised by the HEC and the e-resources’ vendors.”(Public sector librarian)

“[...] training courses conducted by different organisations like PLA and the HEC are attended by our reference staff.”(Private sector librarian)

Heads of some academic libraries in the public sector said that although they did not give formal training in DRS to their reference staff, they gave verbal instructions to the reference staff to handle the service. One interviewee stated that academic institutions and the HEC mostly arrange training courses for faculty members, but they rarely organise such courses for LIS professionals. He suggested that library schools in the country should organise training courses on different topics including DRS for university library professionals on

a regular basis. He also emphasised that foreign training should be arranged for the university library professionals by the HEC. He reflected:

“Academic institutions and the HEC provide training opportunities to faculty members but they don’t provide any such opportunities to librarians. The academic institutions and the HEC should provide training opportunities to library professionals as they provide to the faculty members. Library schools of the country should organise training courses for library professionals and foreign training should also be arranged for them (library professionals) by the HEC.”(Public sector librarian)

6.3.4 Funding for DRS

Costs of DRS include maintenance and upgrading of ICT infrastructure, software, salaries of reference staff, staff training, marketing of the service, reference resources (both printed and electronic). No academic library can manage the DRS without the provision of adequate funds required for the acquisition of necessary resources. Interviewees were asked how much the DRS cost their libraries, and whether their libraries had allocated any specific amount for this service in their annual budgets.

All interviewees reported that no specific amount was allocated for management of DRS in their libraries’ annual budgets. They used their existing resources, i.e. library staff, ICT infrastructure, software, workstation, reference and information resources, for the provision of the service. The annual costs for these resources were included in their libraries’ annual budgets. All the interviewees pointed out that their libraries had been provided with electronic reference and information resources in a variety of subject areas free of cost through the HEC National Digital Library (HEC-NDL, 2013). The following comments illustrate this:

“We don’t have any specific allocation for management of digital reference services. All digital reference resources have been provided free of cost to our library by the HEC digital library. As far as salary of staff and cost of ICT equipment used for digital reference services are concerned, they are paid through our library’s total annual budget.”
(Public sector librarian)

“I can’t separate it (DRS) from other expenditures of library. We use our workstation for handling it. There is no specific allocation for it in our library’s annual budget.”(Private sector librarian)

Heads of some academic libraries stated that although they did not have any specific allocation of funds for DRS in their libraries’ budgets, they had included a separate amount for electronic resources including reference resources in the libraries’ budgets. Apart from electronic reference and information resources provided by the HEC NDL, these libraries were subscribing to some of the important electronic resources through their own budgets. Two of the library heads asserted:

“We have an allocation only for digital information resources in our library’s annual budget.”(Public sector librarian)

“We have a specific allocation for digital resources including reference resources, but not for digital reference services. We spend approximately 7000-8000 US dollars per year on digital resources.”(Private sector librarian)

It was revealed that all academic libraries were utilising their existing resources, i.e. ICT equipment, software, reference staff, workstation, in order to provide DRS. The costs of these resources were included in their annual budgets. They had not allocated any separate amount for the DRS in their budgets. Electronic reference and information resources were provided free of cost to all the academic libraries by the HEC NDL. Besides having access to the HEC NDL’s electronic resources, some academic libraries were subscribing to some of the important electronic resources, for which they had allocated a specific amount in their budgets.

6.3.5 Difficulties faced in the provision of DRS

Academic libraries need to be equipped with necessary resources, such as finance, ICT infrastructure, technology support (for troubleshooting), qualified reference staff, workstation (space, furnishings), reference resources, in order to implement and manage DRS. Apart from these resources, policy and guidelines for the DRS, incorporation of the service into the library’s formal administrative structure, support from library administration, technical support

(Internet and networking facilities) from campus administration, users' education, marketing, and evaluation of the service are key elements required to manage the DRS effectively and efficiently.

Interviewees were asked if they faced any difficulties in providing DRS in their respective libraries. All interviewees stated that electricity crisis, with which the country was confronted, was the biggest problem which they faced in offering the service. The interviewees believed that there is no concept of libraries without ICT nowadays, and ICT equipment is run by electricity. So they perceived the electricity crisis as the major difficulty in delivering the service. Interviewees pointed out that although they had arranged alternative energy resources in the forms of electric generators and UPS (uninterruptible power sources) to cope with this crisis, they still faced a lot of difficulties, such as cost for running and maintaining alternative energy resources, breakdown of alternative energy resources due to overburden of electrical appliances, disconnection of the Internet with the main server due to electric shutdown, interruption and deletion of unsafe data in the computers due to the Internet disconnection, etc. Interviewees' comments on this include:

“Energy crisis is the main problem which we face in providing digital reference services to our users. Although we have an alternative energy resource in the form of a generator, but we have to spend a lot on it to make it run.”(Public sector librarian)

“Electricity crisis is the biggest problem in the country nowadays. [...]digital reference sources and electronic library services are dependent on machines and machines are run by electricity.”(Private sector librarian)

Heads of some academic libraries in the public sector expressing their views on the issues of DRS stated that they faced difficulty in providing required information to users due to lack of electronic resources. All the academic libraries were provided with access to electronic resources by the HEC National Digital Library (HEC-NDL, 2013). Besides, some large academic libraries had subscribed to some of the important electronic resources. The interviewees indicated that the HEC National Digital Library had provided their libraries with access to limited electronic resources and some of these resources were not

available in full text. They had to request the National Digital Library for the provision of such resources that were not available in its collection. The National Digital Library acquired such resources from the British Library and provided them to member libraries through its document delivery service, which took some time. So, in that case, they had to face difficulty in fulfilling users' information needs, as illustrated by interviewees' comments:

“Sometimes, we can't find users' required information from e-resources of the HEC digital library as it has not provided us access to some important databases, for example, Elsevier, EBSCOhost, etc.”(Public sector librarian)

“We have been provided with e-journals by the HEC digital library. These e-journals have limited periods of subscription. So, if any of our users requires an article from any e-journal beyond the subscription period of that e-journal, we can't provide it to him because of limited subscription period. So, we face a problem of unavailability of e-journals for full periods.” (Public sector librarian)

Heads of some academic libraries pointed out that they faced difficulty in delivering DRS due to lack of professional reference staff in their libraries. One library head reported that he himself, with the help of a non-professional staff member, provided the DRS due to an absence of a professional reference librarian in his library. Interviewees commented, for example:

“Currently, we are facing one main problem, absence of a qualified reference librarian, in providing digital reference services to users in our library.”(Public sector librarian)

“Yes, we face difficulty in providing chat reference service as we can't man the chat reference all the time. Staffing the chat service is a problem which we face.”(Private sector librarian)

Another interviewee reported that apart from electricity crisis, his library sometimes faced difficulty in accessing the Internet which impeded his library's provision of DRS. Some interviewees talking on the issues of the DRS complained about users' demand for a quick response to their queries, which sometimes caused difficulty for reference staff in providing the service. They

were of the view that response time for digital reference transactions caused the users' dissatisfaction. One interviewee commented:

“Except for users’ demand for a quick response, we don’t have any major difficulty in providing digital reference services. [...] at the moment we are taking maximum 24 hours to respond to a query (that also for a complicated query).[...]. But, still users expect us to provide a more quick response.” (Private sector librarian)

One library head expressing his views on the issues of DRS enumerated a number of problems, such as lack of training in DRS for LIS professionals in the country, absence of specific software for DRS in academic libraries, non-existence of 24/7 service in academic libraries and absence of collaboration among academic libraries for DRS in the country, which caused difficulties for the academic libraries in managing the service and fulfilling users' reference needs effectively. He believed that if all these issues are resolved, the academic libraries will be able to provide the service in a better way.

6.3.6 Future Plans for DRS

Continuity of a library service depends upon determination of library administration, commitment to the service, availability of resources and utilisation of the service. Regular assessment and implementation of adjustments identified in the assessment process help to improve the quality of the service. DRS had been launched recently by eighteen academic libraries (21%) included in this study. Most of these academic libraries had developed asynchronous DRS, while only two libraries had introduced synchronous DRS. Interviewees were asked about their future plans about the DRS. All the interviewees stated that they would not only continue this service but also improve and expand it by introducing other forms, such as chat/IM reference, video reference in their respective libraries. Comments on this include:

“We intend to not only continue a digital reference service via e-mail but also expand it by introducing and marketing other methods in the future. We want to expand it in a sophisticated manner, for which we plan to establish a digital information resource centre. This centre will have a reference desk and ICT infrastructure for handling digital reference queries.” (Public sector librarian)

“I would like to develop this service in the future. My immediate plan is to launch chat reference service in the library. For this, I intend to hire an expert reference librarian who will provide chat reference services to users during library working hours, if not 24/7.”(Private sector librarian)

All interviewees seemed to be determined to continue DRS in their libraries. They also intended to expand the service by introducing other forms of the service in their libraries. They planned to arrange more resources i.e. reference staff, workstation, ICT infrastructure in order to improve the quality of the service.

6.3.7 Integration of DRS with Traditional Reference Services

Interviewees were asked to give their views as to whether DRS should replace traditional methods of reference services or if it should be integrated with traditional methods. All interviewees were of the opinion that the DRS should be integrated with traditional methods of reference services, and made a part of the mainstream of reference services in academic libraries. Some interviewees stated that since there were a number of students who were not fully conversant with ICT nor did they have ICT equipment in higher education institutions of the country, academic libraries should provide traditional reference services along with the DRS, so that all types of users can access the service and benefit from it. Regarding this, two interviewees remarked:

“[...] the majority of our library users have not yet become fully conversant with ICT. So, I think, both methods (traditional reference and DRS) should be continued side by side in academic libraries of Pakistan.”(Public sector librarian)

“I think, it (DRS) should be integrated with traditional methods of reference services. I am comfortable with it. In academic environment remote access is not very common in Pakistan, because still every student doesn't have a computer or the Internet access at home. They (students) only have it (computer) on the campus. Also with the power crisis in the country, everyone doesn't have a generator or UPS. Even if we try it (to replace traditional reference service with DRS) we can't do it.”(Private sector librarian)

Heads of some academic libraries in the public sector expressing their views on the issue stated that as there were a number of academic libraries in the country

which did not have ICT facilities, traditional reference services could not be replaced with DRS in these libraries. One of these library heads commented:

“There are still many academic libraries which don’t have ICT facilities in Pakistan. We can’t replace traditional methods of reference services with digital reference service until our all libraries are equipped with modern ICT facilities.”(Public sector librarian)

An interviewee advocating the idea of integration of DRS with traditional reference services said that the use of ICT was considered supplementary in academic libraries of the country. Users still preferred manual services and print resources. So, the DRS should be integrated with traditional reference services in the academic libraries. He said:

“ICT is rapidly developing, but its use is still supplementary or supporting in our country. Users still rely on print resources in our country.[...]. By replacing traditional reference with digital reference service we may not be able to fulfill users’ needs fully.”(Private sector librarian)

Heads of some academic libraries in the public sector were of the opinion that there are many users who feel difficulty in clarifying their information needs through e-mail or web chat. They prefer face-to-face consultation for seeking assistance. The reference librarian conducts their interviews in order to get their information needs clarified during face-to-face meetings, and provides them with required information. Therefore, DRS should be integrated with traditional reference services in the academic libraries, so that all types of users can benefit from the service. One of the library heads elucidated this:

“There are many users who can’t convey what information they exactly need over the Internet. We have to ask them a few questions or conduct their reference interviews in order to get clarified their actual information needs during face-to-face consultation. So, I think digital reference service should be integrated with traditional methods of reference services.”(Public sector librarian)

An interviewee supporting the idea of integration of DRS with traditional methods of reference services added that since users vary in their attitudes and behaviours, they choose different means to ask their queries in academic

libraries. He was of the opinion that the DRS should be integrated with traditional reference services in the academic libraries so that all types of users can access the service. He commented:

“By attitude, some users are shy, they prefer digital reference; whereas some users are outspoken, they prefer face-to-face consultation. It (DRS) should be integrated with traditional methods. Both methods should support each other.” (Public sector librarian)

Another interviewee expressing his views about integration of DRS with traditional reference services opined that even if there are a small number of users who ask for the traditional reference services, academic libraries are bound to provide them with the traditional reference services in order to ensure users' satisfaction, which is one of the primary objectives of the academic libraries. He emphasised that the DRS should be integrated with the traditional reference services in the academic libraries so that all types of users can benefit from the service. He added:

“[...] until we have one percent of users who ask for traditional reference service, we can't replace it with digital reference service in our academic libraries, because libraries have to ensure users' satisfaction and fulfill their needs by providing them with services in whichever form (traditional or digital) they require.”(Public sector librarian)

Another library head believed that until and unless all other traditional library services are replaced with digital services in academic libraries, and academic libraries are fully converted into digital libraries, traditional reference services should not be replaced with DRS in the academic libraries. He suggested that at the beginning the DRS should be integrated with traditional reference services, and later on when users become familiar with the DRS and show their interest in this service, the traditional reference services may be replaced with the DRS.

6.4 Development of DRS in Academic Libraries

DRS had been developed recently in a small number of academic libraries included in this study. The usage of the DRS was low as compared to that of face-to-face reference in these libraries. Interviewees were asked to suggest what factors would contribute to the development of DRS in other academic

libraries in the country, and how long it would take for DRS to be developed in other academic libraries.

6.4.1 Factors for Development of DRS

Interviewees expressing their views on the prospects for development of DRS in academic libraries in the country mentioned a number of factors, which would lead to the development of the service in these libraries. Some interviewees stated that the academic libraries were experiencing financial constraints, which prevented them from introducing new library services. They believed that if the financial problems of academic libraries are resolved and they are provided with adequate funds, they will be able to implement new library services including the DRS. Two of the interviewees commented:

“In the current situation, most university libraries are facing financial constraints in Pakistan. Secondly, the university libraries are not given priority in the country. [...]. Until and unless we give priority to the university libraries in the country and the libraries are provided with adequate funds, digital reference service can't be developed in other university libraries in the country.”(Public sector librarian)

“Sometimes, some individuals want to do something but they don't get support in terms of finance to do so in Pakistan. They want to start new services in their libraries but circumstances don't allow them to do so.”(Private sector librarian)

Some interviewees talking on the issue pointed out that some academic libraries in the country had developed good ICT infrastructure, but there were a number of academic libraries which lacked necessary ICT facilities. They believed that if these academic libraries are provided with the necessary ICT facilities, they will start offering electronic services including DRS. Two of the interviewees commented:

“ICT has been developing in our academic libraries for the last few years. Some academic libraries have developed good ICT infrastructure. I think development of ICT will contribute to the development of digital reference services in our academic libraries.”(Public sector librarian)

“Digital reference service will take some time to develop in more academic libraries of Pakistan. The reason for that is that almost

twenty years have passed since computers were introduced in academic libraries of Pakistan, but still there are some university libraries, particularly in the public sector, which don't have computers. Digital reference service is also a part of it."(Private sector librarian)

Heads of some academic libraries were of the opinion that it all depends upon a library head if an academic library develops and offers different library services. They believed that if heads of other academic libraries take the initiative, modern electronic services including DRS will also be developed in their libraries. One library head noted:

"I think, the development of digital reference services will depend upon the heads of university libraries. If university library heads are energetic, have a good mind for the development of library, and want to serve their profession and users, then there are many chances that digital reference services will be developed in university libraries of Pakistan."(Public sector librarian)

Heads of some academic libraries in the public sector said that the library heads with a traditional mindset in some of the academic libraries did not want to introduce modern library services. These traditional mindset library heads wanted to offer library services in traditional ways. They also prevented young LIS professionals from developing modern library services in their libraries. The interviewees were of the opinion that whenever these traditional mindset library heads are replaced with modern mindset library heads, electronic library services including DRS will be developed in these academic libraries.

Some interviewees were of the view that the knowledge and skills of LIS professionals are important factors in designing and developing modern electronic services in academic libraries. They believed that if ICT skills of working librarians are improved, and young LIS professionals, conversant with ICT and having higher education (M.Phil, PhD), are employed in the academic libraries in the country, DRS will be developed in these libraries. This is summed up by two interviewees' comments:

"LIS education at M.Phil and PhD levels is developing in the country. Many students are doing M.Phil and PhD in the country. Library professionals with higher education will definitely bring about changes in traditional library services in academic libraries."(Public sector librarian)

“It (development of DRS) depends upon multiple factors. [...] Are the library staff conversant in this area? How much skilled they are in ICT? How much knowledge they have? These are the basic factors which will affect the provision of digital reference services in academic libraries.”(Private sector librarian)

One interviewee expressing her views on the ICT skills of university librarians pointed out that no regular and systematic effort had been made to improve the ICT skills of the university librarians in the country. In the past, some computer centres with the collaboration of the Pakistan Library Association and the Netherlands Library Development Project were established for imparting training in ICT to LIS professionals including university librarians in the country, but later these centres were closed down. These centres played an important role in developing the ICT skills of LIS professionals. After that no such opportunity had been provided to the librarians for improving their ICT skills. She believed that if regular and systematic training consisting of three levels, i.e. basic, advance and super advance, for developing the ICT skills of university library professionals is arranged in the country, modern electronic services including DRS will be developed in the academic libraries.

Two interviewees stated that the ICT courses were being taught theoretically rather than practically to students at library schools in the country. They suggested that the ICT courses should be taught practically to students at the library schools, so that they can apply ICT skills and manage electronic services including DRS efficiently in the libraries they join. One of them commented:

“I feel that the courses are being taught as a theory. They are not bound towards practical application. Students are studying a course without thinking that they will have to apply it later. Librarianship is an applied profession. ICT courses should be made more practical-based so that students would be able to apply ICT skills when they join the profession. In this way, they will be more confident and equipped with practical ICT skills. Teachers teaching the ICT courses should teach the courses practically rather than only theoretically. The teachers should make students learn the practical skills instead of simply teaching theories.”(Private sector librarian)

Some interviewees talking on the issue of development of DRS said that increasing ICT skills among users and growing use of ICT for accessing information among users would oblige the academic libraries to offer electronic

services including DRS in the future. They believed that the users' information seeking behaviour having a tendency towards the use of the ICT would be one of the main factors which would contribute to the development of DRS in more academic libraries in the country.

Some interviewees pointed out that some of the university library professionals in the country were not even aware of DRS. They believed that if these university library professionals are made aware of the importance of the DRS, and familiarised with techniques of the DRS by providing them training in this area, they will design and develop this service in their respective libraries.

One interviewee was of the view that a number of academic libraries in the country still needed to establish their reputation among users (particularly faculty members) that they could handle electronic services including DRS, and fulfill users' information needs through such services effectively. He believed that if the academic libraries succeed in building up their image among users, users will ask for electronic services including DRS and these services will be developed in the academic libraries.

Other factors, which would lead to the development of DRS in the academic libraries, mentioned by the interviewees included promotion of research culture in academic institutions, increased use of the academic library and its services among students, and solution to the electricity crisis in the country.

6.4.2 Time Period for development of DRS

Interviewees were asked to give their opinions as to how long it would take for DRS to be developed in the rest of the academic libraries in the country. Interviewees divided into two groups with regard to their opinions about this. One group of interviewees was of the view that it would take ten years for DRS to be started in more academic libraries. The second group thought that the DRS would be implemented in other academic libraries in the next five years. These views were expressed by two interviewees:

"I think digital reference services will be developed in more academic libraries of Pakistan in the coming five years. New library

professionals, who are very much conversant with ICT, are joining academic libraries. They will adopt and launch more digital library services including digital reference services in the future.”(Public sector librarian)

“There are a few academic libraries which are adopting this service in the country. The whole culture is not changing. It (DRS) will be developed slowly in the rest of the academic libraries of Pakistan. It may take five to ten years that digital reference services will be started in more academic libraries in Pakistan.”(Private sector librarian)

6.5 Consortium of Academic Libraries for DRS

In order to overcome the problems of staffing and high costs, and to improve quality of the service, a number of libraries in developed countries have started setting up consortia for the provision of collaborative DRS. The consortium helps to extend service hours, and share information resources, workload and expertise among participating libraries. Interviewees were asked to give their opinions about the idea of setting up a consortium of academic libraries for DRS in Pakistan. All interviewees appreciated the idea and stated that setting up such a consortium would help participating libraries share their resources, time, workload and expertise, and provide the service in a better way. It would also help to reduce costs of the service and enable member libraries to save their financial resources. They further added that it would help to develop good relations and linkage among member libraries and provide an opportunity to small academic libraries to benefit from resources of large academic libraries. Two interviewees commented:

“It is a very good idea and it will be very useful for academic libraries in Pakistan. It will help the academic libraries to save and share their resources with one another. It will help member libraries to save their financial resources and to avoid duplication of information resources. It will attract and motivate a small university library with meager resources to become its member as it will provide an opportunity to the small library to benefit from resources of other member libraries by putting in small efforts.” (Public sector librarian)

“I really appreciate this idea. No library can claim that it has all the resources. So, if we share our resources, both human and material, it will be beneficial for both library professionals and users.”(Private sector librarian)

Talking about the prospects for setting up this consortium, the majority of the interviewees were of the opinion that if academic libraries take the initiative it can be established in the country. One interviewee stated that it should be initiated by the leading academic libraries and their precedent should be followed by other academic libraries. Another interviewee was of the opinion that this consortium should be established among specific types of academic libraries, for example among agriculture university libraries or engineering university libraries or general university libraries, so that they can share their information resources and provide the service efficiently. Some interviewees suggested that the HEC in collaboration with academic libraries should establish a collaborative project for DRS in the country. They called upon the HEC to provide all necessary resources and funds for this collaborative project.

Some other interviewees expressing their views on the prospects for setting up this consortium stated that it would be difficult to establish such a consortium in the country due mainly to lack of cooperation and coordination among academic libraries. Two of the interviewees elaborated:

“I don’t see any chance of setting up such a consortium of university libraries in Pakistan. Our university librarians are responsible for this. If our university librarians want to set up it they can. But, I think, they will not be interested in setting up it because they are so much possessive of their library material that they will not take the risk to share it with other libraries for the fear of losing it. They also don’t want to see the development of other libraries by making them members of such a consortium. They are very much ready to involve in the politics but they are not ready to establish such a project with which they can save the money or with which they can improve their reputation.”(Public sector librarian)

“I don’t see any immediate prospects for such a consortium in Pakistan. If some professionals start working at individual level, they may develop it. There is no support at institution’s level to do such kind of things. Our institutions are conservative, because they want to restrict their manpower and resources to themselves, and they lack cooperation.”(Private sector librarian)

Another interviewee pointed out that a consortium of libraries (including some academic libraries) named ‘Lahore Business and Economic Libraries Network (LABELNET)’ was established in the country in order to share resources and

provide collaborative services. This consortium failed due to shortage of staff. He was of the view that if staffing problems of the academic libraries are resolved and they are provided with required staff, such a consortium can be set up and run successfully in the country. He added:

“It is a good idea. Previously, some efforts were made to set up such a consortium named “LABELNET” with collaboration of some libraries of Lahore in Pakistan. But, unfortunately this consortium failed in Pakistan. The reason for its failure was shortage of staff. When member libraries participate in such a consortium they need staff, and the requirement of staff is not fulfilled by the executives. University libraries cannot afford to devote their staff to this type of consortium for full time. The executives should coordinate and fulfill the requirement of staff for setting up such a project. Idea is good, but it cannot be established easily due to the lack of staff in university libraries of Pakistan.”(Public sector librarian)

It was revealed that the majority of the interviewees were in favour of setting up a consortium of academic libraries for collaborative DRS in the country. The interviewees suggested that initially it should be established among leading academic libraries, and later on their precedent should be followed by other academic libraries. It was also proposed that the HEC in collaboration with the academic libraries should set up this consortium. The interviewees stressed that the academic libraries should develop cooperation and coordination among them, and university authorities should provide required resources to the academic libraries in order to establish this consortium.

6.5.1 Resource Sharing for Consortium

Member libraries need to share their time, staff and resources to provide collaborative DRS through a consortium. Interviewees were asked to opine how participating academic libraries can share their time and resources to provide collaborative DRS through a consortium, if it is established in the country. All interviewees suggested that participating libraries should decide to share their time and staff equally by making schedules for offering the collaborative DRS. As regards information resources, interviewees proposed that member libraries

should devise a policy for sharing their information resources through this consortium. Concerning this, two interviewees remarked:

“For information resources member libraries should devise a policy through which they can be able to share their information resources. Through a policy they should decide what type of information resources they should share with one another. As far as time is concerned member libraries can equally share the time to provide collaborative digital reference services.” (Public sector librarian)

“Participating libraries have to make schedules. All participants share their schedules and make sure that for their particular slot a person is available for digital reference services. Time sharing will be the first thing. It will take the workload off from every one. It depends on how we want to do it, round the clock or during working hours. But if it is a consortium, I would love to have it round the clock.”(Private sector librarian)

6.6 Suggestions and Comments

At the end of each interview, interviewees were given an opportunity to comment and provide any suggestions pertaining to the research topic. These comments and suggestions are presented under the following headings.

6.6.1 ICT Infrastructure for DRS

Interviewees stressed that academic libraries should develop necessary ICT infrastructure for effective implementation and management of DRS. They suggested that academic libraries, which did not have the required ICT infrastructure, should devise a project for development of their ICT infrastructure and obtain funds from university authorities or the HEC for it. They believed that once academic libraries have developed their ICT infrastructure, they can design and develop electronic library services including DRS. They also emphasised that the university authorities and the HEC should cooperate with the academic libraries and provide them with required funds in order to develop their ICT infrastructure.

6.6.2 Awareness and Training of LIS Professionals

Awareness and training are key factors which help LIS professionals to implement and manage library services successfully. Interviewees suggested

that in order to create awareness about the importance of DRS among LIS professionals, professional organisations should organise seminars in the country. The interviewees believed that LIS professionals cannot manage DRS efficiently until they possess necessary ICT skills. They emphasised that the ICT skills of university library professionals should be improved and they should be trained in techniques of the DRS. For this, they suggested that professional organisations and library schools should arrange training courses on ICT and DRS for university library professionals in the country.

6.6.3 Marketing of DRS

Academic libraries need to market their services and resources to users, so that users can become aware of them and benefit from them. Interviewees pointed out that the usage of DRS was low in their libraries due mainly to users' unawareness about DRS. They suggested that academic libraries should devise and implement sound marketing strategies to publicise their DRS. They also proposed that academic libraries should organise training courses for users in order to train them to use this service effectively.

6.6.4 User Survey

Regular assessment of a library service helps to identify the strengths and weaknesses of the service. It enables a library to improve the quality of the service by making necessary changes in the service. Interviewees suggested that academic libraries should conduct a user survey in order to get users' opinions about their DRS on a regular basis. They believed that the user survey would help academic libraries to improve the quality of the service and ensure users' satisfaction.

6.6.5 Inclusion of a Course on DRS in LIS Curricula

Interviewees suggested that library schools in the country should design a specific course on DRS and incorporate it in their curricula. This new course should aim to train students in techniques of the DRS. The interviewees believed that the inclusion of such a course in the library schools' curricula would enable future librarians to implement and manage the DRS efficiently in

the libraries they join, thus contributing to the development of this service in academic libraries in the country.

6.6.6 Role of National Library and the HEC

Interviewees called upon the country's national library to formulate guidelines for implementation and management of DRS in academic libraries in the country. They suggested that these guidelines should be formulated keeping in view resources of academic libraries and requirements of their users. The interviewees also called upon the HEC to urge academic libraries to implement this service, and provide them with necessary funds for its implementation.

6.7 Summary

The qualitative data reveal that all the library heads regarded the reference service as an important part of library services. The majority of the academic libraries had set up a reference desk and appointed reference staff (both professional and para-professional) for the provision of reference services. All the libraries provided both traditional and digital reference services. Users mostly adopted face-to-face consultation to ask queries in the libraries. After face-to-face consultation, DRS was mostly used by the users for seeking assistance. Telephone was ranked third for its usage for the provision of reference services in the libraries. The majority of the libraries had not yet formulated a digital reference policy. Reference staff were provided in-house training for handling DRS in most of the libraries. All the libraries used their existing resources to manage the service. The costs for these resources were included in the libraries' periodic budgets. No library had included a specific allocation of funds for DRS in its periodic budget.

Academic libraries faced a number of difficulties, such as electricity crisis in the country, lack of electronic reference and information resources, shortage of professional reference staff, absence of specific software for DRS, lack of training facilities for LIS professionals in the country, in managing the DRS. Despite all these difficulties, all the library heads were determined to continue and expand the DRS by introducing other forms of the service in their respective

libraries. Interviewees emphasised that DRS should be integrated with traditional reference services in the academic libraries. Factors which would contribute to the development of DRS in the academic libraries, such as provision of adequate funds to the academic libraries, development of ICT infrastructure in the academic libraries, initiative of university library professionals, appointment of new LIS professionals having higher education in the academic libraries, training of university library professionals, promotion of research culture in academic institutions, increased use of the library and its services among students and solution to the electricity crisis in the country, were identified.

A number of suggestions, such as the development of ICT infrastructure in academic libraries, awareness and training of university library professionals, marketing of DRS, regular assessment of DRS, inclusion of a course on DRS in LIS curricula, formulation of guidelines for DRS by the country's national library, were made for effective implementation and management of DRS in the academic libraries.

Chapter 7: Discussion

7.1 Introduction

The purpose of this research was to explore the status of DRS in academic libraries in Pakistan, and make suggestions for effective implementation and management of the service in these libraries. In order to achieve the aim and objectives, and address the research questions of the research, a mixed methodology combining quantitative and qualitative methods was used. The quantitative data for the research study were collected through the questionnaire survey, while the qualitative data were gathered through face-to-face semi-structured interviews (details regarding implementation of both methods are presented in section 4.6). The quantitative and qualitative data collected for the research were analysed separately, and the results of the questionnaire survey and semi-structured interviews have been presented in Chapter 5 and Chapter 6 respectively.

In this chapter, the results obtained through the questionnaire survey and the interviews are discussed in relation to the research objectives and research questions presented in Chapter 1, along with the review of the literature (Chapter 2) and the research background (Chapter 3).

7.2 Status of Implementation of DRS

The quantitative results (see Table 5.32) indicate that realising the importance of DRS in the electronic age, 21% (18) of the academic libraries included in this study had implemented this service. Most of these libraries had initiated the service less than five years ago (see Table 5.37). The reviewed literature reveals that the academic libraries in the USA introduced DRS in the mid-1980s, and thereafter many libraries, including academic libraries, in different countries of the world developed this service (see sections 2.3.2 & 2.3.4). The findings of the present research show that the DRS is at an early development stage in academic libraries in Pakistan with nearly one-quarter of the libraries offering the service. In a study conducted to analyse web-based services offered by general university libraries in Pakistan, Mirza and Mahmood (2009, pp.3-4) found that amongst the fifty six general university libraries, only six

libraries had launched DRS by 2009. In another study conducted to explore the readiness level for the DRS of university libraries of the province of Punjab, Pakistan, Malik and Mehmood (2013a, p. 5) discovered that of the thirty eight university libraries, only ten libraries had initiated DRS. The findings of both of these studies underline that DRS is at a developing stage in Pakistani academic libraries, and support the findings of the current research.

Academic libraries require necessary resources and skilled staff to implement and manage modern library services. The quantitative results (see Table 5.35) indicate that a number of academic libraries had not implemented DRS due to various reasons, such as: (1) lack of resources; (2) shortage of skilled staff; (3) financial constraints; (4) no staff time to run DRS; (5) absence of user demand; (6) unawareness of DRS. The lack of resources was the most common factor which impeded academic libraries in developing the service. The second most common factor which inhibited the libraries from introducing the service was the shortage of skilled staff. The lack of financial resources ranked as the third factor which impeded the libraries to launch the service, while unawareness about DRS among LIS professionals ranked as the sixth factor which prevented the libraries from developing the service. This is similar to the findings of Malik and Mehmood (2013a, p. 7), who discovered that paucity of financial and technological resources, shortage of skilled library staff and lack of awareness about DRS among LIS professionals were the main barriers which prevented the majority of the university libraries in the Punjab province from developing DRS. The reviewed literature also reveals that the academic libraries in Pakistan are faced with the lack of resources, financial constraints, and shortage of competent and trained LIS professionals (see section 3.3.1.3.6). The extent of these problems varies from library to library. The large academic libraries, both in the public and private sectors, are less affected by these problems, whereas the small and newly established academic libraries suffer a great deal from them. The findings show that the majority of the academic libraries, which had implemented DRS, are large libraries having better resources (both material and financial) and skilled library staff. A few small libraries headed by LIS professionals who had the vision for innovative library services had launched this service. Those academic libraries which suffered

deficiencies from the lack of competent LIS professionals and scarcity of resources had been unable to develop the service.

7.2.1 Kinds of DRS offered

Both the quantitative (see Table 5.41) and qualitative results reveal that of the academic libraries, which had implemented DRS, all the libraries offered asynchronous DRS (twelve through e-mail and six via web forms), while only two academic libraries provided synchronous DRS (one through web chat and another via IM). A similar finding was reached by Malik and Mahmood (2013a, p.5), who discovered that amongst the university libraries of the Punjab province, most of the libraries (9) provided the asynchronous DRS, while only one library offered the synchronous DRS.

The findings of this research indicate that a small number of academic libraries had implemented DRS (see section 7.2). Most of these libraries had developed asynchronous digital reference systems. Only two libraries had launched synchronous DRS. Both forms of DRS have their particular strengths and weaknesses. The asynchronous DRS provides users with an opportunity to ask reference questions and receive their answers from anywhere at any time over the Internet. It also helps to provide more complete answers to users than could possibly be given at a busy reference desk, as it gives more time to the reference librarian to think about the questions asked and assess users' information needs. The main disadvantage of the asynchronous DRS is that it does not allow for a live interaction between the user and the librarian, which can sometimes cause delay in answering the question due to an interchange of questions and answers to clarify the question asked. The synchronous DRS helps to overcome this problem as it allows for live communication between the user and the librarian, and offers an opportunity to conduct the reference interview to get the user's query clarified and provide the required information instantly.

Both forms of DRS have particular requirements in terms of technological resources and skills for their implementation. The synchronous DRS requires

more advanced technological resources as compared to the asynchronous DRS. Specific software and compatible hardware are required for handling reference transactions through different forms of the synchronous DRS. For example, IM reference requires a specific software product. A number of software products ranging from freely available software Yahoo! Messenger to more sophisticated software QuestionPoint are available for IM reference. Asynchronous DRS simply requires a computer, an Internet connection, an e-mail account and/or a web form for handling reference queries. Answering queries through asynchronous DRS is simpler than handling reference questions via synchronous DRS. Specific skills and knowledge are required to handle reference transactions through different forms of the synchronous DRS. For example, a reference librarian needs to know how to conduct the reference interview using text-based chat, how to attach data files, how to send/push web pages, how to engage users in co-browsing, during IM/chat reference. Asynchronous DRS simply involves answering queries or sending data files/documents via e-mail. The findings of this research and the reviewed literature reveal that the majority of the academic libraries in Pakistan suffer from a shortage of skilled manpower and lack of adequate ICT facilities (see section 3.3.1.3.6). These were the main reasons that the academic libraries mostly offered asynchronous DRS. Malik and Mahmood (2013a, p.7) also found that the majority of the academic libraries in the Punjab province were at a low level of readiness for DRS, and were developing this service at a very slow pace due to inadequate professional skills and expertise among LIS professionals, and the lack of technological resources.

7.2.2 Level of DRS

The level of DRS includes the types of questions the service handles and the user communities the service serves. Before launching DRS, libraries need to determine the types of reference questions the service will answer, and the user community the service will serve. Libraries are advised to decide about these two elements of the service and include them in their digital reference policies before starting the service (IFLA, 2008; RUSA, 2010).

Reference questions have been classified into following four main categories by Katz (2002, pp.16-18): (1) directional questions; (2) ready reference questions; (3) specific-search questions; and (4) research questions. In addition to Katz's categorisation of reference questions, Sears (2001), in her study conducted to analyse digital reference questions at a U.S. academic library, added another category for library policy and procedural questions, and divided directional questions into those involving locations within the physical library, locations outside the library, and the location of resources on the library's website. In the case of DRS, directional questions may mainly include questions regarding the location of online resources on the library's website (Sears, 2001). Apart from these five types of reference questions, a number of questions asked by students in academic libraries fall into the category of reader's advisory questions (Tyckoson, 2001, p.189).

Academic libraries need to decide as to which types of questions they will answer through DRS before initiating the service. It will help them to determine the staffing levels required to handle digital reference transactions. For example, directional and procedural questions, which require no library resources, can be answered by para-professional staff. Ready reference and specific-search questions, which involve a particular search strategy, are best answered by professional staff (Warner, 2001 cited in Desai, 2003, p.24). Similarly, reader's advisory questions and research questions can be best handled by professional staff. Research questions are usually considered to be unsuitable to be answered via DRS. They cannot be handled effectively through the synchronous digital reference transaction as it lasts for a short/limited period of time, and does not allow the reference librarian to search multiple resources to find a complete answer. However, asynchronous DRS can handle research questions effectively as there is a time delay between the question and the answer in this transaction. It provides the reference librarian with an opportunity to assess user's information needs, search various information resources and provide a complete answer.

The quantitative results (see Table 5.49) indicate that amongst the academic libraries offering DRS, the majority of the libraries handle specific-search,

research and quick/ready reference questions, while half of the libraries answer reader's advisory questions. All these types of reference questions require professional knowledge and skills to be handled effectively. A number of libraries also respond to directional and procedural questions. Since the academic libraries mostly answer those questions which require professional knowledge and expertise, they need to staff their DRS with professional staff members in order to handle these questions effectively. Moreover, the academic libraries can also answer procedural questions through FAQs. The libraries can develop FAQ pages regarding their policies and procedures, and place links to FAQ pages on their websites. The quantitative data (see Table 5.41) show that seven out of eighteen libraries had developed FAQ pages and provided their links on the websites. There is a need for all the libraries to develop FAQ pages containing answers to policy and procedural questions and provide links on their websites. This will help to reduce the workload of staff handling DRS. Academic libraries should define the types of questions they handle through DRS and record it in their digital reference policies. The libraries should also mention it on their websites and/or web forms used for asking the questions, so that users become aware of the types of the questions they can ask through the service.

Academic libraries need to determine whether they will provide DRS to all individuals (e.g. users within and outside of particular communities) or whether they will restrict its use to their particular user communities. Students, research staff, academic staff and administrative staff usually form the users' community of an academic library. The quantitative results (see Table 5.53) indicate that of the academic libraries offering DRS, all the libraries provided the service to students, research staff and academic staff. Eight libraries offered the service to their administrative staff, while two libraries served their external members (i.e. students, faculty members and researchers from other academic institutions and research organisations). This implies that the majority of the academic libraries restrict the use of the service to their particular user communities. Academic libraries should record the target users in their digital reference policies, and publicise this policy on their websites. It will guide staff handling

the service to serve the target users, and make users aware of their eligibility to utilise the service.

Academic libraries can restrict the use of asynchronous DRS to target users by requiring them to furnish their institutional IDs while asking a query via e-mail or web forms. Synchronous DRS can be restricted to specific users through a user authentication process (which requires users to utilise their IDs and passwords for accessing the service). The quantitative results (see Table 5.66) indicate that only one library had restricted the DRS to its users by requiring them to provide their credentials. In a similar study conducted to explore the status of DRS in the U.S. academic health science libraries, Dee (2005, p. 21) found that nearly 25% of the libraries included in the study had protected their chat reference services by a password, thus restricting the use of the service to their affiliated users.

In order to restrict the use of DRS to target users, academic libraries should ask users to furnish their institutional IDs while posing a question via e-mail or web forms, and require them (users) to utilise their IDs and passwords for accessing IM/chat reference services. This will help libraries to provide the service only to their affiliated users and avoid misuse of the service.

7.2.3 Usage of DRS

DRS provides more alternatives and flexibility to users to access services. It has extended the reach of reference services beyond the library walls. It provides opportunities to distance learners or those who cannot come to the library to fulfill their information needs in a digital environment. Students, researchers and faculty are taking advantage of this cutting-edge service provided by many academic libraries throughout the world. The quantitative results (see Tables 5.44 & 5.31) indicate that the usage of DRS (with 36.17 mean reference transactions through all formats during a week) was low as compared to that of face-to-face reference (with 77.51 mean reference transactions in a week) in academic libraries. The qualitative results also reveal that users mostly adopted face-to-face consultation to ask questions, and after face-to-face reference they

mostly used DRS for asking queries. Malik and Mahmood (2013b, p. 426) also discovered that face-to-face reference was used more than any other means (including DRS) for providing assistance in university libraries in the Punjab province. Both the quantitative (see Table 5.31) and qualitative results of the present study reveal that amongst other delivery channels used for the provision of reference services, the telephone ranked third for its usage for offering the service, while correspondence (mail) ranked fourth and fax fifth in terms of their usage for delivery of the service in the academic libraries.

It was found that the usage of DRS was low in the academic libraries. Interviewees pointed out that the majority of users were not aware of DRS in academic libraries. Users were usually informed about the service when they visited the libraries to seek in-person assistance. It shows that the academic libraries had failed to market their DRS effectively (see section 7.8), which caused low usage of the service. Marketing plays an important role in promoting a library service. Academic libraries need to devise effective marketing strategies in order to publicise their DRS, so that users can benefit from it. The digital divide was another reason for the low usage of DRS. Unfortunately, ICT facilities are not equally available in all parts of Pakistan. ICT has not yet been introduced extensively in less developed areas, particularly some rural areas, of the country. Students from these areas lack ICT skills, which hinders their use of electronic services including DRS.

The use of ICT among students in the higher education sector of the country is on the rise and many students studying in higher education institutions have ICT equipment. The government of Punjab, under its Youth Development Programme, distributed free laptops to one hundred thousand students and researchers of public sector colleges and universities in the Punjab province on a merit basis in 2012 to help them undertake their studies and research (Youth Development Programme, 2011). The federal government has also planned to provide the same number of laptops free of cost to students and researchers of public sector universities in the country during the academic year 2013-14 under Prime Minister Youth Programme (Prime Minister's Youth Programme, n. d.). But, there are still a number of students in the higher education institutions

in the country, who do not have ICT equipment. To cope with this problem, almost all the higher education institutions (both in the public and private sectors) have established computer laboratories for students. Also, some of the large academic libraries have set up computer laboratories for the students. However, these computer laboratories provide the students with the opportunity to access and utilise online library resources and services only when they are on campus. Students who do not have personal ICT equipment are unable to utilise electronic library resources and services including DRS from their homes or when they are away from the campus. Interviewees perceived it as one of the reasons for the low usage of DRS in the academic libraries.

Academic libraries can offer DRS through SMS using mobile phone technology which enables users to access and utilize the service easily. Despite a vast expansion of the mobile phone network and a large number of mobile phone users in the country (see section 3.3.1.3.4), academic libraries included in this study had not employed the mobile phone technology to provide DRS due to the lack of required technological resources (software) and unawareness among library professionals. A number of software vendors, such as Mosio for Libraries (Mosio for libraries, n d), OmniReference (OmniRefernece, 2014), provide software products which can be utilized to offer SMS reference through mobile phone technology effectively. The libraries' failure to employ mobile phone technology to deliver DRS was one of the reasons which contributed to the low usage of the service.

Users cannot get an immediate response to questions through the asynchronous digital reference transaction as there is a time delay in the question and the answer in this transaction. Long delays in response to questions asked through the asynchronous DRS may cause user dissatisfaction. The quantitative results (see Table 5.47) indicate that although half of the academic libraries (9) answered queries through asynchronous DRS within six hours of their submission during libraries' working hours, users still expected a more prompt response to their queries, as one of the interviewees commented, "*Except for users' demand for a quick response, we don't have any major difficulty in providing digital reference services.*" Interviewees thought that

turnaround time for asynchronous digital reference transactions caused user dissatisfaction, which rendered the service to be under-utilised. Libraries should mention response time on their websites so that users become aware of the time required for response to their questions.

Users can submit questions through asynchronous DRS at any time and they receive answers to their queries from the reference librarian after a certain time. But for asking questions through synchronous DRS, both the user and the reference librarian need to be online simultaneously in order to interact with each other. The user cannot ask the question if the reference librarian is not online or if the service is not available. The results of the questionnaire survey (see Table 5.48) and interviews reveal that the academic libraries offered synchronous DRS only for 8 hours per working day. Users could utilise the service only during specific hours in a working day. Users expect to access and utilise online library resources and services whenever they require them, usually 24/7. Interviewees perceived the time restriction on the use of synchronous DRS as one of the reasons which had caused the low usage of the service in the academic libraries. Academic libraries need to enhance timings of synchronous DRS, so that users have more opportunities to access and utilise the service at their time of need.

7.3 Policy and Guidelines for DRS

A digital reference policy determines the elements of the service, such as target audience, service timings, service behaviors, types of reference questions to be answered, turnaround time for answers, service standards and benchmarks for the quality of the service. The policy helps library staff to manage the service efficiently. The IFLA Digital Reference Guidelines (IFLA, 2008) stress the need of devising a digital reference policy which should describe service goals, code of conduct, guidelines and a review of the policy. The quantitative results (see Table 5.40) indicate that of the academic libraries offering DRS, eight academic libraries had devised a digital reference policy, while the majority of the libraries (12) did not have a digital reference policy.

Malik and Mahmood (2013a, pp.4-5) also discovered that most of the university libraries in the Punjab province included in their study had not formulated a formal digital reference policy.

Academic libraries need to devise a digital reference policy which should clarify parameters of the service (i.e., target audience, types of reference questions to be answered, service timings for synchronous DRS, response time for asynchronous digital reference transactions), service behaviors, standards and guidelines for the service. The formulation of the digital reference policy will enable the libraries to incorporate the service in their administrative structures and help the reference staff to manage the service effectively keeping in view the service goals.

Professional associations have developed guidelines for implementation and management of DRS (see section 2.3.6). These guidelines provide direction to libraries for developing and managing the DRS effectively. The qualitative results indicate that academic libraries had neither followed any such guidelines nor had they devised their own guidelines for managing the service. Non-existence of the guidelines for the DRS in the academic libraries may indicate that they had not been following any formal direction and standards for managing the service.

Academic libraries need to follow guidelines for effective implementation and management of DRS. Both the IFLA guidelines (IFLA, 2008) and the RUSA guidelines (RUSA, 2010) provide detailed and widely accepted recommendations to guide all types of libraries across the globe to implement a standardised DRS and help them to control the quality of the service. The academic libraries should follow these guidelines for developing and managing the service effectively.

7.4 Funding for DRS

New library services need funds and starting a new service requires both initial costs and on-going costs (Breznay and Hass, 2003, p 104). Academic libraries

need funds to acquire necessary resources, such as hardware, software, the Internet connection, reference resources (both printed and electronic), staff, furnishings, to implement DRS. The recurring funds for the maintenance and upgrading of ICT infrastructure, staff salaries, staff training, marketing, reference resources, are also required to manage the DRS on a long-term basis. Libraries planning to implement DRS need to estimate initial costs and recurring costs required to arrange necessary resources for developing and managing the DRS, and allocate a specific amount in their periodic budgets (RUSA, 2010). The qualitative results reveal that amongst the academic libraries offering DRS, none of the libraries had allocated a separate amount for the DRS in its annual budget. All the libraries utilised their already existing resources, i.e. staff, ICT infrastructure, reference resources, furnishings, etc, to manage the service, as one of the library heads stated, *“I cannot separate it (DRS) from other expenditures of library. We use our existing staff and workstation for handling it.”* The costs of these resources were included in the libraries’ periodic budgets. However, a small number of academic libraries had earmarked a separate amount for electronic reference resources in their budgets.

Sloan (1998, p 80) notes that to have a separate budget for DRS depends upon how extensive a service a library offers. He adds that the DRS can be managed economically by utilising existing reference staff, workstation, software (e.g. e-mail system), ICT infrastructure, etc. The findings of this research show that most of the academic libraries had developed asynchronous digital reference systems (via e-mail and web forms) (see section 7.2.1), which need less advanced technological resources as compared to the synchronous DRS. Moreover, the usage of the service was also low in the libraries (see section 7.2.3). As the academic libraries mostly offered the asynchronous DRS and the usage of the service was also low, they had been able to manage the service by utilising their existing resources. This was the main reason that the libraries had not allocated a specific amount for the DRS in their annual budgets.

In order to run DRS extensively and successfully on a long-term basis, academic libraries need to include a specific allocation of funds in their budgets

for covering recurring expenditures of any additional staff, maintenance and upgrading of ICT infrastructure, staff training, marketing, digital reference software. Moreover, academic libraries intending to start the service will need initial funds to acquire necessary resources. They can utilise library development funds or obtain a one-time special grant from university authorities or the HEC (in the case of a public sector library) to meet initial costs of the service. Malik and Mahmood's study (2013a, p.6), conducted to explore preparedness for DRS of academic libraries in the Punjab province, has also identified the development fund from university authorities and the special grant from university or the HEC (indicated by most of the respondents) as possible funding sources for initiating the DRS in these libraries.

7.5 Staffing for DRS

Staffing for DRS and the distribution of the digital reference workload are handled in different ways. In some libraries, the reference staff handle both traditional and digital reference at the reference desk, while in some libraries a separate or select staff provide the DRS (Gross, McClure and Lankes, 2003, p. 174). Sloan (1998, p 79) also suggests that the digital reference work should be equally distributed among the reference staff members or it may be assigned to a separate staff member devoted exclusively to the DRS.

The quantitative results (see Table 5.51 & 5.67) reveal that reference staff in most of the academic libraries handled DRS at the general reference desk. Different staff operated the service at a separate workstation in eight libraries. In a similar study conducted to explore the status of chat reference services in the U.S libraries, Marsteller and Neuhaus (2003, p 64), discovered that the chat reference was mostly provided by the general reference staff in all the libraries included in their study.

Handling DRS at the general reference desk presents the challenge of juggling both the DRS and face-to-face reference. It is very difficult for a reference librarian to handle both digital and traditional reference services simultaneously.

The reference librarian faces difficulty in deciding which query (digital or traditional) be answered first. While assisting a user via the DRS, the reference librarian may keep a walk-in user waiting to get assistance, which could be frustrating for both the user and the librarian. It can affect the efficiency of the reference librarian and the quality of the service. Gross, McClure and Lankes (2003, p. 174) note that there is a consensus among librarians that the DRS, particularly chat reference, needs to be performed at a place away from the physical reference desk. Because of its real-time nature, need for multi-tasking skills to handle multiple questions and resources at a time, and absence of physical cues of expression and body language, librarians feel it difficult to answer queries quickly and concisely in chat reference while being at the physical reference desk, where a long queue of users may be waiting for assistance. E-mail reference also requires the reference librarian to think about the question asked, assess the user's information need, and search multiple resources to provide the required information, which need time and concentration on the part of the reference librarian.

A significant challenge that academic libraries face is that implementing DRS can increase workload of already busy reference staff handling traditional reference services and create staffing problems, as one of the library heads commented, "*We face difficulty in providing chat reference services as we can't man the chat reference all the time*". In order to provide an effective service, the DRS should be operated by separate staff at a place away from the physical reference desk since the reference desk mainly provides prompt service to those who come to the desk in person. Academic libraries need to create some staffing strategies in order to handle the DRS effectively. A number of academic libraries throughout the world have adopted different staffing approaches for handling the DRS. Among these approaches, the most common are tiered reference, collaborative staffing, assigning the digital reference work to separate or select staff (Lessick, 2000, pp.32-34; Gross, McClure and Lankes, 2003, p. 174; Dempsey, 2011, pp. 9-14; Probst, 2005, pp.53-54; Dee, 2003, p.9). Tiered reference provides libraries with the opportunity to utilise services of paraprofessionals for answering simple reference queries, and reserve the time and expertise of librarians for answering complex and research-oriented

questions. Collaborative staffing helps the libraries to distribute the digital reference workload among librarians. Assigning DRS duties to separate or select staff allows the libraries to provide quality service without any interruption. The growth of these staffing approaches has prompted a number of academic libraries to adopt the most effective staffing technique for providing the service.

It was found that most of the academic libraries had staffed their DRS by general reference staff who handled the service at the traditional reference desk, while eight libraries had assigned the digital reference work to separate staff (see Table 5.51). The qualitative data show that some academic libraries lacked reference staff which caused difficulties for them in staffing the DRS. The library head in a small academic library (being the only professional librarian) handled the service due to the absence of a reference librarian (see section 6.3.5). Whereas, some academic libraries had deputed other professional staff members to manage reference services due to the absence of designated reference staff (see section 6.2.2). Moreover, the quantitative results indicate that nearly 39% of the academic libraries included in this study had employed reference staff (including professional, para-professional and non-professional reference staff), while the majority of the libraries (61%) did not have reference staff (see Table 5.23). Keeping in view the staffing patterns followed by the academic libraries to staff their DRS and the availability of reference staff in academic libraries, the following three staffing approaches can be adopted to handle the DRS effectively:

Separate or select staff: If staff and budget allow, academic libraries may assign responsibility for DRS to a separate or select staff member. The selection of a staff member should be made on the basis of ability, interest and skills required for operating the service. He should be given training to handle the service. He should be provided the opportunity to operate the service at a place away from the reference desk, in his office or at a separate workstation designed exclusively for the DRS. It will allow him to handle the digital reference transactions with full devotion and attention without being interrupted, and further develop and maintain the service. Depending upon the digital reference

workload and availability of staff, the number of staff members handling the DRS may be increased. Traditional reference services may be handled by the general reference staff at the physical reference desk.

By assigning responsibility for the digital reference work to a separate staff member, academic libraries will be able to provide quality service and ensure users' satisfaction. The large academic libraries (both in the public and private sectors), having better financial and human resources, can adopt this staffing approach.

Tiered reference service: It involves the use of personnel other than professional librarians to staff the initial reference service point that users approach in a library. In this approach, paraprofessionals can be deputised to answer simple and repetitive reference questions, such as directional, procedural and quick/ready reference questions through face-to-face interaction at the physical reference desks, and refer users to reference librarians for higher-level and research-oriented questions. Whereas, reference librarians can be made responsible for handling DRS and dealing with users' complex face-to-face reference queries. It will help to reduce the workload of reference librarians and provide them with the opportunity to utilise their time in handling digital reference transactions effectively, locating electronic reference resources and further developing the service. Reference librarians may handle the DRS and the complex face-to-face reference queries in their offices. The personnel staffing the physical reference desks should be trained to conduct a basic reference interview to identify users' information needs, and provided clear instructions as to which types of questions are to be referred to reference librarians. Banks and Pracht (2008) also noted that non-professionals staffed the reference desks effectively in a significant number of academic libraries included in their study. They observed that owing to increased time spent on instruction, DRS, computer software programmes and online databases, librarians could not devote much time to handling traditional reference services at the physical reference desks. Therefore, a number of libraries utilised non-professional staff to answer simple questions at the reference desks, and refer users to librarians for higher-level and specialised questions.

This staffing approach can be adopted by those academic libraries which have professional and para-professional reference staff. The academic library with a single professional librarian can also adopt this approach. In the academic library with a single professional librarian, a para-professional staff member can be deputed to answer simple face-to-face reference queries at the physical reference desk and refer users to the librarian for complex questions. The librarian can operate DRS and help users with complex face-to-face queries in his office.

Collaborative staffing: In this staffing approach, librarians working in different sections/units of an academic library can staff DRS at specific hours during the day. The digital reference work can be equally distributed among the librarians staffing the service by making schedules, and it should be integrated in their assignments so that they do not consider it an extra burden on them. Librarians can share the digital reference workload by handling the service in their respective offices during their shifts. Selection of the librarians staffing the DRS should be made on the basis of interest, ability and specific skills required for operating the service. The librarians staffing the service should be trained in skills of the DRS. A service coordinator may be assigned responsibility for monitoring daily operation of the service including scheduling. Academic libraries which have no designated reference staff can adopt this staffing approach.

7.6 Staff Training

Reference staff need to be trained in techniques of DRS before they are assigned responsibility for handling the service. They are required to be trained on the software and get used to answering reference queries in chat mode (Breznay and Haas, 2003, p 109). The main skills that a reference librarian should have to handle the DRS efficiently include: typing skills, multi-tasking skills, communication skills (especially in writing), database and online searching skills, interviewing skills in a digital environment, knowledge of reference resources, familiarity with software product, etc. (IFLA, 2008; Gross, McClure and Lankes, 2003, p. 175). The reference staff not only need to be

trained in these skills before starting the service, they are also to be provided on-going training in order to keep them abreast of the latest developments in the techniques and tools of the DRS. The RUSA Guidelines for Implementing and Maintaining Virtual Reference Services stress the need to train the staff for handling the DRS in the following words:

“Virtual reference requires of library staff many of the same communication and interpersonal skills necessary for other forms of reference. The absence of a physically present patron and the different modes of communication may call for additional skills, effort, or training to provide quality service on par with face-to face reference services.”
(RUSA, 2010)

The quantitative results (see Table 5.52) indicate that of the eighteen academic libraries, eleven libraries (60%) provided in-house training in different skills of DRS to their staff. The qualitative data also reveal that a number of libraries organised in-house training sessions to train their staff in techniques of DRS. These training sessions were conducted by library heads and IT professionals. The main skills taught through these sessions included answering queries through e-mail and chat reference, searching databases and electronic resources. The library staff were also provided hands-on training in necessary ICT skills. In a study conducted to explore training practices adopted by the U.S. academic libraries, Devine, Paladino and Davis (2011, p. 200) also discovered that a number of libraries included in their study arranged in-house training sessions to train their staff in different skills for operating chat reference services in their respective libraries.

Besides being provided training in necessary skills of DRS, library staff need to be familiarised with parameters of the service, service behaviours, policy and guidelines. The research found that eleven out of eighteen academic libraries trained their staff mainly in different skills of the DRS, while seven libraries did not provide any in-house training to their staff for operating the service. There is a need that all the academic libraries conduct in-house training sessions to train their staff for handling the service. Apart from providing training in necessary skills of the DRS, the academic libraries need to familiarise their staff with service behaviours, parameters, guidelines, and institutional digital reference

policies, so that the staff can operate the service effectively according to set standards.

Vendors of digital reference software provide training on site. They also provide online assistance and handbooks to libraries which use their software products (Breznay and Haas, 2003, p. 109). The qualitative results of this research reveal that the only academic library using the IM software for the provision of IM reference, had not provided any training on the software to its staff through the software vendor. However, a few academic libraries had arranged training sessions to get their staff trained in the use of electronic resources by the electronic resources' vendors. The academic libraries intending to use any specific software product for the DRS can ask the software vendor to provide necessary training (either onsite or remotely/online) on the software product to their staff. It will provide an opportunity for the libraries to get their staff trained on the software product, and identify and resolve any technical glitches in advance. The software vendor can also be asked later on to arrange a refresher training session for the staff in order to make them aware of any changes/developments in the software product.

Continuing education helps LIS professionals to keep their knowledge updated and improve their professional competencies. In Pakistan, library schools, library associations, different libraries and some international organisations organise continuing education courses on different topics (e.g. ICT, digital library, electronic resources, etc) for LIS professionals. The quantitative results indicate (see Table 5.52) that library staff in seven out of eighteen academic libraries had learned necessary skills for handling DRS through continuing education programmes. The qualitative data also divulge that reference staff of some of the academic libraries were trained in ICT skills and the use of electronic resources through continuing education sessions organised by different library associations and the HEC. The evidence from this research and the reviewed literature indicate that there is a lack of opportunities for LIS professionals to improve their professional skills through continuing education in the country (see section 3.4.2). Khan and Rafiq (2013) also discovered that LIS professionals in the country needed continuing professional education in order

to improve their skills in different areas, such as ICT, management and leadership, communication. They called upon training agencies in the country to conduct training courses to improve the LIS professionals' skills in these areas on a regular basis. Keeping in view the lack of necessary skills for managing DRS among university library professionals and the gloomy situation of continuing professional education for LIS professionals in the country, a number of interviewees in the present study suggested that library schools and professional associations should organise training courses on the DRS for LIS professionals. They believed that these training sessions would help LIS professionals develop necessary skills for handling the DRS.

One of the main factors that contribute to the development of professional knowledge and competencies of LIS professionals is the professional degree programme they study. At present, nine library schools impart LIS education at undergraduate and postgraduate levels to meet needs of the job market in the country. The quantitative results (see Table 5.52) indicate that library staff in seven out of eighteen academic libraries learned the skills for handling DRS through their professional degree programmes. It shows that the curricula being taught at most of the library schools in the country were not designed to help students develop necessary skills to manage the DRS. The qualitative results and the reviewed literature also reveal that the curricula taught at the majority of the library schools did not meet the needs of the job market in the country (see section 3.4). An interviewee pointed out that the contents of courses on the reference service being taught at the library schools did not include the latest techniques and methods of the reference service, which could help students to manage the DRS. The reviewed literature also reveals that some important topics were not included in the contents of courses on the reference service in LIS curricula for both Master's and Bachelor's degree programmes (see section 3.4.1). In view of this fact, a number of interviewees suggested that the library schools should design a separate course on the DRS and get it approved by the HEC for incorporating it in their curricula. They believed that the inclusion of such a course in the LIS curricula would help students to learn necessary skills for managing the DRS.

LIS professionals need to be equipped with necessary ICT skills in order to manage electronic services including DRS. The interviewees pointed out that graduates of the country's library schools lacked ICT skills as they were mostly taught theoretical aspects of ICT courses. They were not practically trained in ICT skills due to mainly lack of ICT laboratories and shortage of teachers possessing required ICT qualification. The lack of ICT skills among graduates of the library schools inhibited their management of electronic services including the DRS in the libraries they had joined. Warraich and Ameen (2011) also discovered that the curriculum taught at one of the main library schools in the country had failed to develop students' skills in some areas, particularly ICT and communication, which affected their employability due to the lack of required skills among them. They stressed the need to redesign the curriculum in order to improve students' skills in those areas.

7.7 Reference Collection

Reference resources (both printed and electronic) are an essential component of DRS. Mizzy and Mahoney (2002, p. 70) assert that "A first step taken by libraries developing chat reference services would include the compilation of a virtual ready reference collection". Before starting the DRS, an academic library is required to build a sound and balanced reference collection keeping in view users' information needs. The reference staff handling the DRS need to be familiarised with all types of reference and information resources available in the library. The RUSA guidelines also emphasise the need to develop an electronic reference library before initiating the DRS (RUSA, 2010).

Results of the questionnaire survey (see Table 5.17) indicate that all the academic libraries had reference collections in print form, while nearly 73% of the libraries had reference materials in electronic form. In a study conducted to explore the status of reference and information services in the academic libraries located in Lahore, Pakistan, Rehman and Mahmood (2010, p. 11) also found that all the libraries included in their study held reference collections in print format, while 87% of the libraries had reference materials in electronic form.

Electronic resources have greatly enhanced the process of information storing, disseminating, searching and using. They facilitate greatly the provision of information through DRS. Realising the importance of the electronic resources in this digital era, the HEC has established a National Digital Library (NDL) to provide university libraries (both in the public and private sectors) in the country with access to a large number of electronic resources including e-journals, e-books and databases (HEC-NDL, 2013). The qualitative data reveal that all the academic libraries have access to the NDL resources. Besides having access to the NDL e-resources, some large academic libraries subscribed additionally to some of the important e-resources including e-journals and e-books.

7.8 Marketing of DRS

A library service not only needs to be accessible, it also needs to be publicised through some effective marketing strategies in order to make users aware of the service. Breznay and Haas (2003, p.111) state that “Marketing is the key to the success of any new service and digital reference is no exception.” Academic libraries need to develop sound marketing strategies in order to advertise and publicise DRS. Marketing helps to promote the service and enables users to benefit from it. Both the RUSA and IFLA guidelines for the DRS lay emphasis on devising an on-going marketing plan for the DRS (RUSA, 2010 and IFLA, 2008).

Findings of this research (see section 7.2.3) indicate that the usage of DRS is low in academic libraries. The qualitative results reveal that one of the main reasons for the low usage of the DRS is users’ unawareness of the service, as one of the interviewees stated that, “[...] *when they (users) visit the reference desk to ask their reference questions through face-to-face consultation they come to know that they can also use other method (DRS).*” This shows that the academic libraries have failed to market their DRS effectively.

Academic libraries need to market their DRS on an on-going basis in order to make existing and new users aware of the service, thus enabling them to take

advantage of the service. A library's website can serve as an effective means to market and publicise the DRS on a continuous basis. The quantitative data (see Table 5.54) indicate that of the academic libraries offering the DRS, the majority of the libraries (16) use their websites to publicise the service. However, websites of some of these libraries were not effective in marketing the service. Placement of the link to the DRS on a library's website is the most important aspect of on-going marketing for the DRS (Vilelle, 2005, p.71). The link to the DRS placed at a prominent location on the library's homepage makes the service visible, enables users to find the service easily and attracts them (users) to use the service, thus affecting usage of the service. The quantitative results (see Table 5.64) indicate that amongst the academic libraries offering the DRS, half of the libraries have placed the link to the service on their homepages, while half of the libraries had provided the indirect link to the service from other links/buttons, i.e. services (33.3%), contact us (11.1%), about the library (5.6%) on the homepages. By providing the indirect link to the DRS from other links/buttons, half of the academic libraries had made the service inconspicuous, which made it difficult for users to locate the service on the libraries' websites. The low usage of the DRS in the academic libraries could be attributed to these libraries' failure to effectively publicise the service through their websites.

Instructional programmes can play an important role in publicising and marketing DRS (Coffman, 2003, p.83; Dee, 2003, pp10-11; Vilelle, 2005; Taddeo, 2008). The quantitative results (see Table 5.54) indicate that ten out of eighteen academic libraries organised information literacy sessions to familiarise users with the DRS. There is a need that all the libraries arrange information literacy sessions to make users aware of the service. The information literacy sessions designed for the DRS should aim to familiarise users with the various formats of DRS offered and the benefits the service can provide to them. Users should also be trained to utilise the service in these sessions. Both the quantitative (see Table 5.28) and qualitative data reveal that the majority of the academic libraries employed various other means, such as orientation programmes, printed guides and handouts, induction sessions, audiovisual presentations, web-based guides and handouts in order to provide

instruction to users. The academic libraries can utilise these instructional means to publicise and market the DRS effectively. In a study conducted to analyse chat reference services in the U.S. academic health science libraries, Dee and Newhouse (2005, p.23) also discovered that apart from using the websites, these libraries utilised library orientation sessions and instructional workshops for marketing their chat reference services.

Academic libraries can utilise different types of promotional materials, such as flyers/pamphlets, table tents, bookmarks, signage, notice boards, library handbooks, newsletters, brochures/leaflets to advertise and market their DRS without spending a lot of money. The libraries can design a simple flyer/pamphlet containing brief description about the service (e.g. brief information about the service, service timings, web address) to advertise the service. Flyers can be distributed at circulation desks, reference desks, library computer labs and information literacy sessions. Similarly, table tents containing the same information can be created and placed at tables in reading halls and computer labs in the libraries. The libraries can also design signs (in a large and visible form) containing brief information about the service along with web address, and place them at reference desks or circulation desks to inform users about the service (Vilelle, 2005, pp.73-74; Taddeo, 2008, pp.237-240). Library notice boards can also serve as an effective tool for publicising the service. The academic libraries can place a notice containing brief information about the service on their notice boards to apprise users of the service. Library publications, e.g., handbooks, newsletters, brochures/leaflets can also be used to publicise the service. The libraries can include a separate section about the service in these publications to make users aware of the service. The quantitative data (see Table 5.54) reveal that ten out of eighteen academic libraries publicised their DRS through promotional activities. There is a need that all the libraries adopt these marketing techniques to advertise and publicise the service. It will help the libraries to attract more users and promote the service.

Marketing is essential for making DRS successful. The failure of academic libraries to effectively market their DRS had provided users with limited

opportunities to discover the service, thus rendering the service to be under-utilised. Lack of usage of the DRS could pose the risk of wasting both time and resources to the academic libraries, which eventually may oblige them to terminate the service, as also noted by Coffman (2003, p. 75) that, “Lack of traffic is the kiss of death for virtual reference services.” Therefore, in order to continue the DRS on a long-term basis, increase usage of the service and enable users to benefit from it, the academic libraries need to market the service aggressively by employing as many marketing techniques as possible. Moreover, marketing DRS is not a once off activity. Academic libraries need to market the DRS on an on-going basis so that it is not forgotten and new users do not remain ignorant of its existence.

7.9 Integration of DRS with Traditional Reference Services

Although there have been many changes and developments in reference service, four basic functions of the reference service, “to instruct the user how to use the library; to answer the user’s queries; to aid the user in the selection of good reading materials; and to promote the library within the community” as identified by Samuel Green (1876) have remained unchanged (Tyckoson, 2003, pp. 13-14). What have changed are tools used for performing these functions. New technologies have changed the way libraries provide information and the way users search for information, and what the users expect from the reference service. Over the years, libraries have adopted commonly used technologies to provide users with the opportunity to ask questions and receive answers in a variety of modes. DRS has provided more alternatives to users to access the service. With the growing use of online resources among students and the increasing number of students studying online or at a distance, many academic libraries throughout the world have developed DRS to meet users’ reference needs in a virtual environment.

While DRS utilises different modes for delivery of reference service, core functions of the service as identified by Green remain constant: to instruct, assist, and aid users, while promoting the library and its services. The RUSA

Guidelines for Implementing and Maintaining Virtual Reference Services (RUSA, 2010) stipulate that virtual reference service be accorded the same status and quality goals as face-to-face reference, and integrated into the main stream of reference services offered by a library, so that all modes of the service (in-person, telephone, and virtual) are supported at a level to ensure quality service. Integration of DRS into the main stream of reference services helps libraries to ensure equity of access for users and manage all types of reference service with the same quality and standards.

The qualitative results show that all the academic libraries offering DRS had integrated their DRS with traditional reference services. The interviewees pointed out that although the use of electronic resources and services is on the rise in higher education institutions of the country, there are still a number of students who are unable to access and utilise electronic resources and services due to unavailability of ICT facilities and lack of necessary ICT skills among them. Keeping this fact in view, all interviewees advocated the integration of DRS into traditional reference services in academic libraries, as one of the library heads stated, *“I think, it (DRS) should be integrated with traditional methods of reference services. [...] In academic environment remote access is not very common in Pakistan, because still every student doesn’t have a computer or the Internet access at home.”* The interviewees believed that an integrated reference service would treat all types of reference service equally and provide equal opportunities to all types of users (i.e. in-person and remote) to access and utilise the service. In order to ensure equity of access to the service and the provision of all types of reference service with the same quality and standards in a Canadian academic library, Duncan and Gerrard (2011) have also recommended incorporation of virtual reference service into the main stream of reference services.

7.10 ICT Infrastructure for DRS

Effective ICT infrastructure including hardware and software, an Internet connection, and technical support for troubleshooting and maintenance of the ICT infrastructure are essential for implementing and managing DRS.

Computers are basic tools for operating the DRS. The quantitative data (see Table 5.61) indicate that amongst the academic libraries offering DRS, all the libraries had enough computers to manage the service. Malik and Mahmood's study (2013b, p.423), conducted to explore the ICT infrastructure needed for implementing the DRS in university libraries in the Punjab province, also revealed that all the university libraries included in their study had computers required for handling the service.

Apart from hardware, libraries need suitable software for operating various forms of DRS. For example, libraries need e-mail software and accounts to offer e-mail reference. There are a number of e-mail systems. Most of the librarians and academic libraries all over the world have their e-mail accounts which they use for communications. Librarians and academic libraries usually use their existing e-mail accounts and software to provide e-mail reference. For handling various forms of synchronous DRS, libraries need some specific software products. With the development of DRS in libraries, software vendors have produced a number of commercial software packages containing a wide range of features for handling the service. Besides these, there are a number of free software products available which can be used for different forms of synchronous DRS. For example, Yahoo! Messenger, AOL Instant Messenger, Windows Live Messenger are freely available software packages for instant messaging which can be utilised for IM reference. While selecting a software package for the DRS, the academic libraries need to take into account various factors, such as price, reference requirements, compatibility with library's existing hardware and software, bandwidth limitations, local technical support. The findings show that most of the academic libraries in this study offered asynchronous DRS, while only two libraries provided synchronous DRS (one via web-based chat and another through IM) (see section 7.2.1). The quantitative results (see section 5.2.4.3) indicate that the only library offering the IM reference used an IM software product named 'Meebo' for providing the service. It was a free software package, which has been discontinued (Meebo, n. d.). It was not a library-specific software product and did not contain those specific features which other sophisticated commercial software packages like

QuestionPoint and VRLPlus have. It was suitable only for a simple enquiry service (Bary et al., 2010, pp.50-54).

The speed of the Internet plays an important role in providing effective DRS. The Internet connection with adequate bandwidth facilitates transferring and sharing of data files, and helps to operate various forms of DRS effectively. The quantitative results (see Table 5.63) indicate that amongst the academic libraries offering DRS, half of the libraries have been provided with Internet connectivity through PERN (a project of the HEC). PERN has the substantial capacity to deliver Gigabit speeds of Internet service (up to 100MB or 1000MB and even more) to connecting organisations, which facilitates greatly audio and video communication. Currently, PERN is providing a service to 150 universities and their sub-campuses in the country (Pakistan Education Research Network, 2013). PERN's Internet service is suitable for handling various forms of DRS including video reference. There is a need that all the academic libraries take advantage of this Internet service for providing a quality DRS. The HEC needs to provide PERN's Internet service to all higher education institutions in the country.

Academic libraries need technical support for troubleshooting of software, hardware, and maintenance of overall ICT infrastructure used for DRS for smooth operation of the service. The quantitative results (see Table 5.68) show that library staff in most of the academic libraries were responsible for troubleshooting and maintenance of the ICT infrastructure. These libraries had set up separate IT labs/sections for which they had employed IT staff who maintained the ICT equipment, as one of the library heads stated, *"We have five ICT staff members, including an ICT administrator and a network administrator, who maintain ICT infrastructure of our library."* Besides, in some academic libraries, LIS professional and para-professional staff conversant with the ICT infrastructure also performed some tasks related to ICT troubleshooting. Both the quantitative (see Table 5.68) and qualitative data indicate that a number of academic libraries obtained the services of IT experts from their respective institutions' IT departments in order to get the ICT infrastructure maintained. It was found that LIS professionals in a small number of academic libraries carried

out some tasks related to ICT troubleshooting. There is a need that LIS staff operating DRS in all the academic libraries be trained on necessary ICT troubleshooting skills, so that they can solve basic ICT-related problems and provide the service smoothly. Moreover, if budget allows, more academic libraries employ IT staff for maintenance and troubleshooting of the ICT infrastructure.

7.11 Evaluation of DRS

Libraries involved in providing DRS need to evaluate their services regularly to ascertain how successful their services are in fulfilling users' needs. Evaluation helps libraries to know the strengths and weaknesses of their services, and make necessary adjustments in the services to improve the quality of the services. Both the RUSA and IFLA guidelines for DRS emphasise the need to conduct regular assessment of the DRS to measure effectiveness of the service, and to implement necessary changes to the service based on the assessment results (RUSA, 2010; IFLA, 2008). Highlighting the importance of evaluation of DRS, Vandecreek (2006, p. 106) states:

“assessment projects expose the strengths and weaknesses of current programs, pushing libraries to constantly analyse, improve, expand, and modify their service in all its forms of delivery”.

The main methods used for evaluation of DRS include user feedback/survey, analysis of question logs and review of transcripts (RUSA, 2010, Gross, McClure and Lankes, 2003, and Breznay and Haas, 2003). The users' feedback helps to find out how far the users are satisfied with the service. Roesch (2006) notes that users' satisfaction can be measured using three criteria: (1) satisfaction with the answer; (2) satisfaction with the service mentality; and (2) willingness to use the service in the future. The quantitative results (see Table 5.56) indicate that amongst the academic libraries offering DRS, half of the libraries evaluated their DRS. All of these libraries employed user surveys to assess their services. The study of Dee and Newhouse (2005, p.26), conducted to explore the status of chat reference services in the U.S.

academic health science libraries, also revealed that the majority of the libraries included in their study evaluated their chat reference services through a pop-up survey, which allowed users to provide their feedback at the end of a chat session.

Some libraries ask users to complete a questionnaire at the end of a chat session as some of the software products used for chat/IM reference have the features to conduct a user survey at the end of the session. The user survey can also be conducted at a later stage via e-mail. Since the academic libraries in this study mostly offered asynchronous DRS, they can conduct the survey via e-mail. They can either send the questionnaire as an e-mail attachment to a target audience or can design a web survey and forward its link to target users for obtaining their feedback. Because of certain advantages, such as cost-effectiveness, quick response, efficiency, accuracy in recording responses, web surveys are suitable for obtaining users' feedback. Vandecreek's study (2006) also revealed that a U.S. academic library employed a web-based survey to get users' feedback in order to assess its e-mail reference service. Whatever form of survey the academic libraries use, there is a need that all the libraries in this study conduct user surveys on a regular-basis in order to evaluate their DRS. It will enable them to measure users' satisfaction levels with their services and to improve their existing services, keeping in view the assessment results.

7.12 Collaboration for DRS

Libraries have a long tradition of collaboration. They have collaborated in preserving collections, cataloguing materials, and have borrowed materials from one another to fulfil their requirements. Online tools and networks have facilitated them greatly to share their resources with one another. For various reasons, such as to share the workload, to extend the service hours, to reduce cost of the service, to share resources, to share knowledge and expertise of several librarians, many libraries including academic libraries all over the world have started to collaborate with one another to provide DRS.

All interviewees in this study favoured the idea of setting up a consortium of academic libraries for the provision of DRS in Pakistan. They believed that collaboration among the academic libraries for the provision of DRS would greatly help the libraries to overcome their various problems and provide quality service by sharing their resources and expertise. It would provide the opportunity to small academic libraries with meagre resources to offer this cutting-edge service without putting in much effort and benefiting from resources of the large academic libraries in the country. Highlighting the major challenges facing Pakistani academic libraries in the twenty-first century, Ameen (2011, p.176) has stressed the need for resource sharing among academic libraries. Several years ago, Haider (2003) also emphasised the need for developing cooperative projects among Pakistani libraries, including academic libraries, in order to overcome financial constraints and dearth of resources, and facilitate various library operations and services.

There are different models for collaborative digital reference services. Jin et al (2007, p.734) have categorised different collaborative digital reference systems that existed across the world at the time of their study into three possible collaborative structure models, i.e. peer-to-peer model, the centre model, the mixture model. The peer-to-peer model allows a library to collaborate with member libraries directly. There is no centre that coordinates collaborative activities of member libraries in this model. It can be adopted for small-scale collaboration. The centre model involves coordinating all collaborative activities through a centre. A member library sends a collaborative request to the centre first and then the centre forwards it to a library best able to handle it. This model is suitable for large-scale collaboration. The mixture model contains the features of both the peer-to-peer model and the centre model. In this model, one library can collaborate with other member libraries directly and send the collaborative request to the suitable library without the centre's intervention. In addition, the collaborative requests can also be coordinated through the centre in this model. Though, this model is flexible, it is more complicated to implement than the first two models. It is also suitable for large-scale collaboration (Jin, et al 2007, pp.734-735). One of the interviewees in the present study suggested that a collaborative digital reference project should be developed among specific types

of academic libraries in Pakistan, for example, among engineering university libraries or among general university libraries. She believed that it would enable participating libraries to handle collaborative requests effectively as all of them have their information resources, and LIS professionals possessing knowledge and expertise in the same field. Some of the interviewees proposed that the HEC in collaboration with academic libraries should set up a general consortium for DRS in the country. They suggested that the HEC should provide finance, necessary infrastructure and technical assistance for developing this project, and supervise and coordinate various activities of the project from one centre. Keeping in view various structure models (used for different collaborative digital reference systems) identified by Jin et al. (2007) and the suggestions of interviewees, the following two models can be adopted for developing a collaborative digital reference project among academic libraries in Pakistan:

- **Peer-to-peer model:** In this model, a collaborative digital reference project can be developed among the same types of academic libraries, for example, among health sciences university libraries or agricultural university libraries or general university libraries. Collaboration can be made at a local, regional or national level. Each member library can collaborate with any of the member libraries directly in this model. This model is suitable for a small-scale cooperative project.
- **The centre model:** In this model, the HEC or an academic library can act as a centre for coordinating collaborative activities of participating libraries. Member libraries will send their collaborative requests to the centre first and then the centre will assign these requests to suitable libraries to handle. The HEC can use its own network PERN, which is already providing services and connecting 150 universities and their sub-campuses across the country (Pakistan Education and Research Network, 2013), for developing this project. This model can be applied to large-scale collaboration.

For adopting either of the above-mentioned two structure models for a collaborative digital reference project, academic libraries need to take into account various factors, such as the form of DRS to be adopted, software to be

used, hours of operation for the service and/or turnaround time, staffing of the service, staff training, marketing, funding, technical issues regarding interoperability of software platforms. Both the IFLA and RUSA guidelines (IFLA, 2008; RUSA, 2010) have provided recommendations and standards for developing collaborative digital reference service projects. Academic libraries should follow these recommendations for effective implementation of the collaborative project.

7.13 Barriers to Implementation and Management of DRS

The findings of this research show that DRS is at an early development stage in academic libraries in Pakistan, with a small proportion of the libraries offering the service. Both the quantitative (see Table 5.71) and qualitative results reveal that the academic libraries are faced with a number of issues which affect the implementation and management of DRS. These issues are discussed in the following sections.

7.13.1 Lack of Competent and Skilled LIS Professionals

Competent and skilled LIS professionals play an important role in the development of academic libraries. The findings of this research and the reviewed literature (see section 3.3.1.3.6) reveal that academic libraries in Pakistan lack competent LIS professionals. The main reasons which contribute to the scarcity of competent and skilled human resources in the academic libraries include:

- Flaws in the education system of library schools in the country, such as low intellectual content curricula, lack of ICT-related courses, inadequate laboratory facilities, dominance of theoretical courses without practical application, use of traditional methods and lack of PhD faculty members (Haider, 2008, p.83)

- Lack of continuing education programmes for LIS professionals in the country
- Migration of competent LIS professionals to OPEC countries to seek better job opportunities due to unsatisfactory working conditions in terms of growth opportunities and monetary benefits in Pakistan.

The findings show that the scarcity of skilled LIS professionals had prevented a number of academic libraries from developing DRS (see Tables 5.35). A number of online training resources are available which provide LIS professionals with an opportunity to learn necessary competencies and techniques to implement and manage DRS effectively. For example, RUSA provides online courses on various aspects of reference services including DRS for LIS professionals (RUSA, 2014c). RUSA has also provided an online guide for digital reference coordinators and librarians, 'Virtual Reference Companions' (RUSA, 2014d). This guide aims to furnish digital reference librarians with tips on effective implementation and management of DRS. Ohio Library Council provides web-based training materials on different skills of reference services including DRS for LIS professionals (Ohio Library Council, 2014). Minitex (an information and resource sharing program of the Minnesota Office of Higher Education and the University of Minnesota libraries), helps LIS professionals to improve their professional competencies through online training courses on various aspects of librarianship including DRS (Minitex, 2014). Moreover, different software vendors designing and producing software products for DRS, such as QuestionPoint (QuestionPoint 2013b), Mosio for Libraries (Mosio for libraries, n d), LiveAssistance (LiveAssistance 2013), also provide online training to the libraries which utilize their software packages. University library professionals were unable to take advantage of these online training resources due to the lack of awareness. There is a need to create awareness about these online training resources among LIS professionals in the country.

In order to improve the professional knowledge and competencies of LIS professionals, the interviewees emphasised the need for arranging continuing education courses on different topics including ICT and DRS on a regular basis

in the country. They called upon library schools and professional associations in the country to come forward and play their roles in improving professional competencies of LIS professionals through continuing education. Interviewees also urged the library schools to improve their over-all education systems, redesign their courses on ICT, and introduce a specific course on DRS in order to enable the future LIS professionals to develop the necessary skills for managing electronic information services including DRS.

In order to fill the vacuum of competent LIS professionals in academic libraries in the country, there is an urgent need to improve the education system of library schools, create awareness about online training resources on DRS among LIS professionals through seminars/workshops and arrange continuing education courses on DRS for working librarians on a regular basis. Moreover, the HEC and university authorities need to pay special attention to working conditions of university library professionals and provide them with growth opportunities and monetary benefits at par with other professionals in the country.

7.13.2 Absence of Suitable Software for DRS

With the development of DRS in libraries, software companies have developed a number of software products for DRS. They are commercial software packages which contain a number of features. The findings of this research indicate that none of the libraries used any such software package to handle DRS (see section 7.10). One of the interviewees stressed the need for introducing these software products for handling DRS in the academic libraries. He believed that if the academic libraries are provided with these software packages, they would be able to improve the quality of their services.

7.13.3 Lack of ICT Facilities

Academic libraries in Pakistan started to use computer technology in the 1980s and some of the libraries had been computerised by the end of the 1980s. With the establishment of the HEC in 2002, there had been an unprecedented growth in higher education institutions in the country, but the pace of

development of ICT infrastructure in the academic libraries had remained slow. The majority of the small and newly established academic libraries have lagged behind the large academic libraries in developing the ICT infrastructure. Malik and Mahmood (2013a) also discovered that the majority of the academic libraries in the Punjab province lacked necessary technological resources, which impeded them in launching DRS. Interviewees in the present study stressed the need for developing the ICT infrastructure in academic libraries in order to introduce electronic information services.

7.13.4 Absence of Digital Reference Policy

A digital reference policy determines the elements of the service and helps library staff to manage the service effectively. It also ensures the continuity of the service on a formal basis. The findings of this research show that most of the academic libraries had not yet formulated a digital reference policy. In the absence of a set-down policy, the academic libraries cannot offer the service according to set standards and achieve service goals. The absence of a formal digital reference policy in the academic libraries is an obstacle to managing DRS effectively.

7.13.5 Lack of ICT Application

A library automation system helps to perform library functions efficiently. In Pakistan, some academic libraries have been fully automated, while some have merely developed automated catalogues by using some kind of free software (Ameen, 2011, p.173). There are a number of academic libraries in the country which have not yet been fully automated. Jan and Sheikh's study (2011, p.4), conducted to explore the status of automation in the public sector university libraries of Islamabad and Khyber Pukhtoonkhwa province, also revealed that of the twenty one academic libraries, eleven were fully automated, seven were partially automated, while three were not automated. A number of factors have contributed to the slow development of automation process in the academic libraries, such as: an absence of systematic planning for automation, constraints faced in software and hardware selection, nonexistence of standards; financial constraints, lack of competent human resources (Haider,

2003 cited in Haider 2007). Library automation is necessary for designing and developing electronic library services. Academic libraries cannot manage digital information services effectively until they are fully automated. The lack of library automation is one of the major barriers to implementation and management of DRS in the academic libraries.

7.13.6 Scarcity of Training Facilities for LIS Professionals

Continuing professional education is essential for LIS professionals to keep them abreast of the latest professional knowledge and developments. The findings of this research and the reviewed literature show that there is a lack of continuing education programmes for LIS professionals in the country, which inhibit them from improving their professional skills (see section 3.4.2). In order to improve professional knowledge and competencies of LIS professionals, one interviewee suggested that regular and systematic training consisting of three levels, i.e. basic, advance and super advance, should be arranged in the country. She believed that such training programmes would help LIS professionals to develop their skills, and enable them to design and introduce modern library services. In a study conducted to highlight the major challenges facing Pakistani academic libraries, Ameen (2011, pp174-175) also perceived the lack of continuing education programmes as a barrier to developing professional competencies of LIS professionals. She emphasised the need for arranging more continuing education courses to improve ICT skills of working librarians in order to enable them to introduce digital information services in libraries.

7.13.7 Financial Constraints

The findings from this research and the reviewed literature reveal that academic libraries in Pakistan lack finances (see section 3.3.1.3.6). A number of academic libraries had not implemented DRS due to financial constraints (see Table 5.35). The qualitative data also indicate that the academic libraries suffer from a lack of finances which inhibit them from introducing new services, as one of the interviewees commented:

“Sometimes, some individuals want to do something but they don’t get support in terms of finance to do so in Pakistan. They want to start new services in their libraries but circumstances don’t allow them to do so.”

In Pakistan, the academic library budget usually comes out of the general allocation of the academic institution. There is no general agreement regarding the proportion of the total institution budget which should be allocated to the library. The proportion of the total university budget allocated to the library varies from university to university. Three surveys of public sector academic libraries, conducted over different periods of time, revealed a wide variation in the proportion of total university budget allocated to the library. The percentage of library budget in the university’s total budget allocated to different academic libraries during these periods ranged from 0.3 to 9.1 (Mahmood, Hameed and haider, 2005, p. 135). Large academic libraries have better financial resources than small ones. They have been able to introduce electronic library services. But most of the small and newly established academic libraries are faced with financial problems which prevent them from developing electronic services.

7.13.8 Scarcity of Resources

Academic libraries require resources to design and develop electronic information services. The findings of this research and the reviewed literature show that most of the academic libraries (particularly the small ones) in Pakistan are faced with a scarcity of resources (see section 3.3.1.3.6). Lack of resources had prevented a number of academic libraries from implementing DRS (see Table 5.35).

7.13.9 Electricity Crisis

The electricity crisis in the country has badly affected all aspects of daily life. Both the questionnaire respondents (Table 5.71) and the interviewees perceived the electricity crisis as the most important issue, which badly affected implementation and management of electronic library services including DRS. One of the interviewees commented, *“Electricity crisis is the biggest problem in the country nowadays. [...]digital reference sources and electronic library*

services are dependent on machines and machines are run by electricity.” The qualitative data reveal that although to cope with this crisis academic libraries had arranged alternative energy resources, they still faced a number of problems due to the crisis.

7.13.10 Access to Electronic Resources

Electronic resources are an essential part of DRS. Almost all the academic libraries in the country have been provided with access to the electronic resources of the HEC National Digital Library (HEC-NDL, 2013). In addition, a small number of academic libraries have also started digitising their collections, but they are mainly involved in digitising theses and rare materials (Rafiq and Ameen, 2013, pp.44-45). The qualitative data indicate that all the academic libraries have access to the NDL resources. Besides, a few large academic libraries subscribe additionally to some of the important electronic resources. Whereas, small libraries solely depend upon the NDL for meeting their needs for electronic resources. The interviewees pointed out that some of the electronic resources provided by the NDL were not available in full text, while some others had limited periods for subscription. The libraries faced difficulties in fulfilling users’ information needs due to the limited subscription periods for some of the electronic resources. The interviewees urged the HEC to broaden the scope of the NDL by subscribing to more electronic resources, and by extending the subscription periods for the existing electronic resources.

7.13.11 Inadequate Physical Facilities

Academic libraries require proper and adequate physical facilities within which all library functions can be carried out. In Pakistan, large academic libraries have their own specific library buildings, while small and newly established academic libraries, e.g., Air University library, Islamabad; Bahria University library, Islamabad, are housed in such buildings that are not built for the library purpose. The small academic libraries do not have proper physical facilities to manage library services. Haider (2004, p.233; 2007, p.176) also noted that a number of academic library buildings in Pakistan suffer from functional deficiencies. He stressed the need to develop national standards for designing

academic library buildings. He also suggested that a committee comprising an architect having experience in the library building work, and the country's senior librarians should be constituted by the HEC in order to design any new academic library building in the country.

7.13.12 Lack of Local Research and Literature on DRS

The reviewed literature shows that there is a lack of research on DRS in Pakistan. Only a few research studies related to DRS have been conducted in the recent past. The present study is the first comprehensive research study on this subject, which explores different important aspects pertaining to DRS in academic libraries. The research literature on DRS is growing in other developing countries as well. For example, in India, Maharana and Panda (2005) explored the status of DRS in selected academic libraries and discovered that these libraries were far behind academic libraries in developed countries in introducing a standardised DRS. Singh (2012) analyzed DRS in selected university libraries in India and found that these libraries had mostly developed asynchronous DRS via e-mail. The study of Shafi (2007) outlined the challenges facing libraries in south Asian countries, i.e., India, Bangladesh, Pakistan, Sri Lanka, Nepal, Maldives and Bhutan, in developing DRS. It focused on issues like language diversity, poor literacy rate, and digital and information divide. In Malaysia, Abdoulaye and Majid (2000) investigated the use of the Internet for delivery of reference services in public university libraries, and Kadir Wan Dollah and Singh (2010) carried out a study to determine the effectiveness of DRS in selected Malaysian academic libraries. In Philippines, Ramos and Abrigo's study (2012) revealed that DRS was in early stages of development in academic libraries, as 22 out of 356 libraries included in the study had introduced the service. In Africa, Ekpenyong and Edem (2010) analyzed DRS in academic libraries in Nigeria, and Sekyere (2011) investigated the status of DRS in academic libraries in ten African countries, i.e., Burkina Faso, Cameroun, Cape Verde, Ivory Coast, Ghana, Mali, Mauritania, Nigeria, Senegal and Sierra Leone, and found that DRS was at a developing stage in these libraries as only eighteen percent of the libraries had launched the service.

In Pakistan, there is a need for library schools and LIS practitioners to conduct more research studies on DRS in order to contribute to the local and international literature in this area. The local literature on DRS will help create awareness about the importance of the service among LIS professionals, and enable them to envisage and manage the service in line with local circumstances.

7.14 Summary

DRS is at a developing stage in academic libraries in Pakistan. The usage of DRS is low as compared to that of face-to-reference in the academic libraries due to reasons, such as inappropriate and inadequate marketing strategies adopted to publicise DRS, lack of necessary ICT skills among users, lack of ICT facilities available with the users. Factors which contribute to the academic libraries' failure to market and publicise DRS include: improper location of the link to the DRS on the library websites, lack of instructional programmes, shortage of promotional activities.

It was found that academic libraries lack skilled and competent human resources to manage DRS. Factors contributing to the scarcity of competent human resources in academic libraries include: lack of in-house training, shortage of continuing education programmes for LIS professionals in the country, shortcomings of courses on reference service and ICT taught at library schools. Academic libraries utilised their existing resources to develop and manage DRS. They have not included any specific allocation of funds in their budgets to meet the recurring expenditures of the service. The majority of the libraries have not yet formulated a digital reference policy.

The research identified issues and problems which affect implementation and management of DRS in academic libraries. They include: scarcity of competent human resources; access to electronic resources; absence of suitable software for DRS; financial constraints; lack of ICT facilities; lack of a digital reference policy; lack of ICT application; paucity of resources; lack of continuing education

opportunities for LIS professionals; electricity crisis; inadequate physical facilities; lack of local research and literature on DRS. In order to overcome problems facing academic libraries, interviewees stressed the need for developing a collaborative project among academic libraries to provide DRS.

Chapter 8: Conclusions and Recommendations

8.1 Introduction

This chapter presents the conclusions of the research study. Based on these conclusions, recommendations relating to the effective implementation and management of DRS in academic libraries in Pakistan are made.

8.2 Conclusions

The overall aim of this research was to investigate and analyse DRS in academic libraries in Pakistan. The study adopted a mixed methods approach by combining quantitative and qualitative methods to achieve its aim and objectives. The results of both quantitative and qualitative methods have been discussed in detail in Chapter 7. The main conclusions of the study are presented under the headings below.

8.2.1 Status of Reference Services

In order to fully exploit their resources and services in supporting research and teaching activities of higher education institutions, academic libraries need to provide reference assistance to their user communities. Academic libraries are expected by users to embrace emerging technologies affecting reference functions and information needs of the users in order to provide efficient reference services. Findings show that almost all the academic libraries included in this study provided reference services through traditional modes (Table 5.30), while DRS was at an early development stage, with a small proportion of libraries offering the service (Table 5.32). It was found that amongst the academic libraries which had implemented the DRS, the majority of them were large libraries with better resources (both human and material).

The findings reveal that amongst different delivery methods used for the provision of reference services in academic libraries, the face-to-face reference was mostly used by users for seeking assistance, whereas DRS ranked second in terms of its usage for obtaining reference assistance. Amongst other modes of reference services, the telephone ranked third, correspondence (mail) fourth

and fax fifth in terms of their usage for delivery of reference services (Tables 5.31 & 5.44, and section 6.2.4.1). Factors which contributed to the low usage of the DRS in academic libraries included: (1) academic libraries' failure to market their DRS effectively; (2) time restrictions on the usage of synchronous DRS; (3) users' dissatisfaction with the service due to long turnaround time for asynchronous digital reference transactions; (4) lack of ICT skills among users; and (5) lack of ICT facilities available for the users.

In Pakistan, almost all academic libraries have provided users with access to the e-resources of the HEC NDL. Moreover, some large libraries have also subscribed to some of the important electronic resources and made them accessible to users. Instead of visiting the libraries physically to obtain their required information, students, researchers and faculty have started to rely on e-resources to fulfil their information needs. Also, there is an increase in the number of higher education institutions offering distance learning programmes in the country and the number of students participating in those programmes. Keeping in view the growing use of online resources among students, researchers and faculty, and the increasing number of distance learners in the higher education institutions in the country, academic libraries need to design and develop DRS in order to fulfill users' reference and information needs in a virtual environment. (**Objective two:** *to acquire an overview of reference services (traditional and digital) being provided in university libraries of Pakistan*)

8.2.2 Nature of DRS offered

The research found that as DRS was at a developing stage in academic libraries included in this study, they had mostly developed asynchronous digital reference systems, while only two libraries had introduced synchronous DRS (Table 5.41). (**Objective three:** *to identify and analyse the nature and level of DRS being offered in university libraries of Pakistan*)

8.2.3 Technologies used for DRS

There are a number of technological tools available which can be employed to handle both asynchronous and synchronous DRS. The findings reveal that the

most common technological tool used for the asynchronous DRS by the academic libraries was e-mail (12), while web forms were utilised by six libraries to handle asynchronous digital reference transactions. The tools used for the synchronous DRS by the two academic libraries included web-based chat and IM. Apart from employing various asynchronous and synchronous tools to handle digital reference transactions, some academic libraries had developed FAQs, and placed a link to the FAQs on their websites in order to provide answers to policy and procedural questions (Table 5.41). It was found that none of the libraries had utilised video reference or VoIP to handle digital reference transactions. (**Objective five:** to identify the ICT infrastructure and technologies used for DRS in university libraries of Pakistan)

8.2.4 Management of DRS

The study considered various aspects related to the management of DRS in academic libraries. The conclusions pertaining to these aspects are presented in the following sections. (**Objective four:** to explore various aspects pertaining to the management of DRS in university libraries of Pakistan)

8.2.4.1 Policy and Guidelines

A digital reference policy determines the elements of the service and sets service goals, while guidelines for DRS provide direction and standards for implementing and managing the service. The findings reveal that amongst the academic libraries offering DRS, the majority of the libraries had not yet formulated a formal digital reference policy (Table 5.40). With regard to guidelines for the DRS, it was found that none of the libraries had followed any guidelines for implementing and managing the service (see section 6.3.1), which may indicate an unplanned approach to developing and managing the service.

8.2.4.2 Funding

Academic libraries require finances to acquire the necessary resources to design and develop DRS. They also need funds to meet recurring costs of DRS in order to run the service on a long-term basis. To meet the recurring costs of

the service, the academic libraries need to include a specific allocation of funds in their periodic budgets. The findings reveal that all the academic libraries had utilised their existing resources (both human and material) to initiate the service. It was also found that the libraries had not included any specific allocation of funds in their budgets to meet the recurring expenditures of the service (section 6.3.4).

8.2.4.3 Staffing

Staffing strategies adopted to deliver DRS affect greatly efficiency and quality of the service. In order to provide an effective service, the DRS needs to be operated by separate, dedicated staff at a place away from the physical reference desk as the reference desk is mainly used to provide face-to-face reference. The findings reveal that the majority of the academic libraries had staffed their DRS by general reference staff who handled the service at the physical reference desk (see Tables 5.51 & 5.67). It is very difficult for a reference librarian to handle the DRS at the reference desk where he is expected to deal with face-to-face queries as well. Handling both digital and face-to-face reference simultaneously at the reference desk could affect the efficiency of the reference librarian and quality of the service. The findings show that some of the academic libraries faced difficulties in staffing the service due to shortage of professional reference staff (see section 6.3.5).

8.2.4.4 Staff Training

Library staff need to be trained in skills of DRS before they are tasked with handling the DRS. The findings show that amongst the academic libraries offering DRS, eleven libraries provided in-house training in techniques of DRS to their staff, while the staff in seven libraries had not received any formal in-house training to operate the service. Apart from the non-existence of in-house training for DRS in a number of libraries, scarcity of continuing education courses for LIS professionals in the country, deficiencies in professional degree programmes offered at the country's library schools and lack of software vendors' training were identified as the main factors, which prevented the library staff from developing necessary skills to manage DRS

(Table 5.52). The interview participants stressed the need to create awareness about the importance of DRS among university library professionals, to improve their ICT skills and to train them in techniques of DRS. They also suggested that the country's library schools should design a course on DRS and include it in their curricula, so that students can develop necessary skills to manage DRS. (see sections 6.6.2 & 6.6.5). The interviewees also emphasised that library schools should improve the students' ICT skills by teaching them ICT-based courses practically in order to enable them to manage electronic services including DRS efficiently (section 6.4.1).

8.2.4.5 Reference Collection

Reference resources (both printed and electronic) are an essential element of DRS. The findings indicate that besides having reference materials in print form (Table 5.17), all the academic libraries offering DRS had been provided with access to electronic reference and information resources of the HEC NDL (HEC-NDL, 2013). Although the NDL claims to provide access to a large number of e-resources covering a wide range of disciplines, the interviewees complained that some of the e-resources were not available in full text and some others had limited periods for subscription. Libraries faced difficulties in meeting users' information needs due to unavailability of some of the e-resources in full text and limited subscription periods for the resources. The NDL also provides those e-resources which are not available in its collection through a document delivery service to member organisations. The interviewees pointed out that it took some time to obtain the required e-resources through the NDL document delivery service, which caused difficulty for them in fulfilling users' information needs (see section 6.3.5). It was found that some large libraries also subscribed to some of the important electronic reference and information resources to fulfill their users' information needs (see section 6.3.4).

8.2.4.6 Marketing

Academic libraries need to devise and implement effective marketing strategies in order to publicise their DRS on an on-going basis. Marketing helps to

promote the service and affects usage of the service. A library's website plays an important role in marketing the DRS. The location of the link to the DRS on a library's website is an important factor in publicising the service on a continuous basis. The service link placed at a prominent location on a library's homepage helps to make the service conspicuous and enables users to discover the service easily. The findings show that half of the libraries had buried the service link under some other links on their homepages (see Table 5.64), which had made the service inconspicuous and difficult to locate. Apart from inappropriate placement of the link to the service on the libraries' websites, lack of instructional programmes and shortage of promotional activities for the DRS were identified as the main factors (Table 5.54), which contributed to the academic libraries' failure to market and publicise their DRS effectively.

8.2.4.7 Evaluation

Regular assessment of DRS keeps academic library managers informed about the strengths and weaknesses of their services, and enables them to improve their services. The findings reveal that half of the libraries evaluated their DRS by employing user surveys (Table 5.56). There is a need that all the academic library managers realise the importance of undertaking assessment of the DRS on a regular basis. It will help them to make improvement to their services, and utilise their time and resources in providing quality service, thus ensuring users' satisfaction.

8.2.5 ICT Infrastructure

The findings of the study indicate that all the academic libraries had enough computers to manage DRS (Table 5.61). Internet connectivity was provided to half of the academic libraries by PERN (Pakistan Education Research Network, 2013), which has sufficient bandwidth and is suitable to handle various formats of DRS including VoIP and video reference, while half of the libraries had been connected with the Internet through other Internet Service Providers operating in the country (Table 5.63). There is a need that all the academic libraries are provided with an Internet connection through PERN, so that they can operate the service effectively and provide quality service.

With regard to the software product used for the provision of IM reference, it was found that the only academic library offering IM reference had employed a free software product to provide IM reference (see section 5.2.4.3). It was a simple IM software product (which has been discontinued), and did not contain those special features which other library-specific software packages designed for the IM reference have.

In order to maintain the ICT infrastructure, more than half of the libraries had employed IT staff, while the rest of the libraries obtained technical support from their respective institutions' IT departments for this purpose (see Table 5.68 and section 6.3.2). It was also found that LIS professionals in a small number of libraries performed some minor tasks related to the maintenance of the ICT infrastructure. (**Objective five:** *to identify the ICT infrastructure and technologies used for DRS in university libraries of Pakistan*)

8.2.6 Level of DRS

The level of DRS consists of two elements, i.e., the user population the service serves and the types of questions the service answers. The findings indicate that all the academic libraries provided DRS only to their affiliated users (Table 5.53). The types of questions answered through the DRS affect the staffing level of the service. For example, research, specific-search, quick/ready reference and reader's advisory questions are best answered by professional staff, while directional and procedural questions can be answered by para-professional staff. The findings show that the majority of the academic libraries answered specific-search, research, quick/ready reference and reader's advisory questions through their DRS (Table 5.49). As these questions require professional knowledge and skills to be answered effectively, academic libraries need to staff their DRS by professional staff members. (**Objective three:** *to identify and analyse the nature and level of DRS being offered in university libraries of Pakistan*)

8.2.7 Collaboration

The findings show that academic libraries were faced with a number of

problems which affected the implementation and management of DRS (see section 7.13). Collaboration can help the libraries to overcome problems and provide them with an opportunity to offer this service effectively. All interviewees supported the idea of developing a collaborative digital reference project among the academic libraries in the country. They believed that the collaborative project will enable member libraries to share their resources and expertise, reduce the cost of the service and share workload, thus helping them to provide quality service (see section 6.5).

8.3 Recommendations

Based on the research conclusions, the recommendations are presented in three parts: recommendations for HEC and university authorities, recommendations for academic libraries, and recommendations for LIS schools and professional associations.

8.3.1 Recommendations for HEC and University Authorities

- 1) HEC should formulate a national policy whereby academic libraries in the country implement and provide DRS to meet users' reference and information needs in a digital environment. (see **Conclusion: 8.2.1**)
- 2) HEC should provide the Internet service of its project PERN to all academic libraries of the country in order to enable them to implement and manage DRS effectively. (see **Conclusion: 8.2.5**)
- 3) HEC and university authorities should play an active role in the development of DRS in university libraries of the country. They should provide funding to academic libraries to improve their ICT facilities and acquire necessary resources to implement and manage the DRS. They should enhance periodic budgets of academic libraries to enable them to meet the running expenditures of the service. (see **Conclusion: 8.2.4.2 & 8.2.5**)
- 4) University authorities should appoint more reference staff (equipped with the latest professional knowledge and competencies) for academic

libraries in order to overcome their staffing problems. (see **Conclusion: 8.2.4.3**)

- 5) HEC should broaden the scope of its Digital Library by subscribing to more e-resources including reference resources in order to enable academic libraries to fulfill the reference and information needs of their users effectively. (see **Conclusion: 8.2.4.5**)
- 6) HEC Digital Library should speed up the process of providing e-documents through its document delivery service. (see **Conclusion: 8.2.4.5**)
- 7) HEC in collaboration with some leading academic libraries should develop a consortium for DRS at national level to provide an enquiry service to all academic libraries in the country. In this regard, the HEC should follow 'the centre model' proposed in section 7.12. (see **Conclusion: 8.2.7**)

8.3.2 Recommendations for Academic Libraries

The following recommendations are made for Pakistani academic libraries to implement and manage DRS effectively.

8.3.2.1 Policies and Guidelines

Academic libraries need to formulate formal policies for DRS in order to set service standards and goals, and guide library staff to manage the service effectively. The policies should clarify parameters of the service (i.e., target audience, types of reference questions to be answered, service timings for synchronous DRS, response time for asynchronous digital reference transactions), service behaviors, standards and guidelines for the service. Moreover, for proper and effective implementation and management of DRS, academic libraries need to follow guidelines. In this regard, they should follow the IFLA Digital Reference Guidelines (IFLA, 2008) and RUSA Guidelines for Implementing and Maintaining Virtual Reference Services (RUSA, 2010), which

provide recommendations and direction for guiding all types of libraries around the world to implement and manage DRS. (see **Conclusion: 8.2.4.1**)

8.3.2.2 Allocation of Funds for DRS

Academic libraries need to allocate a separate amount in their periodic budgets to meet recurring expenditures of the service, such as salaries of any additional staff, maintenance and upgrading of ICT infrastructure, staff training, marketing, software, reference materials, etc. For this, they should reallocate funds from various library expenditures and include a specific allocation of funds for DRS in their periodic budgets. It will help the libraries to manage the service on a long-term basis successfully. (see **Conclusion: 8.2.4.2**)

8.3.2.3 Staffing

Academic libraries need to devise and adopt staffing techniques in order to overcome the staffing problems and provide an effective DRS. In view of availability of reference staff in the academic libraries and staffing patterns followed by academic libraries to staff their DRS, three staffing approaches for effective staffing of DRS have been proposed and discussed in section 7.5. These staffing approaches include assigning the digital reference work to separate or select staff, tiered reference, or collaborative staffing. Academic libraries should adopt the most appropriate staffing technique to staff their DRS for the provision of an effective and efficient service, in line with their particular circumstances. (see **Conclusion: 8.2.4.3 and 8.2.6**)

8.3.2.4 Staff Training

In order to equip LIS professionals with the necessary skills to manage DRS efficiently, academic libraries should:

- 1) provide in-house training in different techniques of DRS to their staff/reference staff (both professionals and paraprofessionals) before they are assigned responsibility for operating the service. The libraries should train staff in various skills related to DRS, such as database and

online searching skills, interviewing skills in a digital environment, knowledge of reference resources (both printed and electronic), typing skills, familiarity with software products intended to be used for the DRS. Staff should also be familiarised with service behaviours, parameters, guidelines, and institutional digital reference policies, so that they can operate the service effectively according to set standards. Libraries should provide training to the staff on an on-going basis in order to keep them up to date with the latest developments in the techniques and tools of the service;

- 2) organise software vendors' training sessions to train the staff on the software product intended to be used for the DRS;
- 3) encourage the staff to attend those continuing education courses held in the country, which could help them improve their skills to handle the DRS. (see **Conclusion: 8.2.4.4**)

8.3.2.5 Upgrading and Maintenance of ICT Infrastructure

In order to provide effective DRS, academic libraries need to take some necessary steps to upgrade and maintain their ICT infrastructure, which include:

- acquire an Internet connection with adequate bandwidth (preferably through PERN Internet service);
- acquire a library-specific digital reference software product for efficient management of the service;
- employ IT staff for troubleshooting and maintenance of ICT infrastructure; and
- increase allocation of funds for upgrading and maintenance of ICT infrastructure in their periodic budgets. (see **Conclusion: 8.2.5**)

8.3.2.6 Marketing and Promotion

In order to promote DRS and enable users to benefit from it, academic libraries need to market the service on a continuous basis by devising some sound and

effective marketing strategies. The academic libraries should make effective use of their websites in order to market and advertise the DRS. The name of the DRS, and design and location of the service icon on a library's website are the most important aspects of on-going marketing for the DRS. An attractive and memorable name of the service along with eye-catching icon at a prominent location on the library's homepage can help users to find the service easily, and attract them to use the service. Academic libraries should create an attractive logo and memorable name for the service, and place its icon at a prominent location on their homepages. It will enable existing and new library users to find the service as soon as they access the libraries' homepages. The libraries should place the service icon on as many pages as possible within their websites (e.g. in the catalogues, services, electronic resources etc.) or on the bottom of all pages to attract the users and provide them with the opportunity to ask questions at the point of need. Placement of the link to the DRS at a prominent location on the libraries' homepages and number of the links to the service throughout the libraries' websites will help the libraries greatly to promote the service.

Academic libraries should use their instructional means, such as orientation programmes, printed guides and handouts, induction sessions, audiovisual presentations, web-based guides and handouts, to publicise their DRS. They should also utilise different types of promotional materials, such as flyers/pamphlets, notice boards, table tents, signs, library publications (e.g. handbooks, newsletters, brochures/leaflets) to publicise and advertise their services. (see **Conclusion: 8.2.4.6**)

8.3.2.7 User Education Programmes

Academic libraries need to devise and conduct well-organised user education programmes in order to enable users to utilise the service effectively. These programmes should aim to:

- 1) make users aware of the various formats of DRS offered;
- 2) familiarise them with the benefits they can gain from the service;

- 3) instruct them how to pose questions through different formats of the DRS; and
- 4) train them how to use various formats of the DRS effectively.

The user education programmes should be publicised properly and organised on a regular basis. These programmes will help users to be equipped with the knowledge and skills required to utilise the service efficiently and motivate them to use the service to fulfil their reference and information needs, thus enhancing the usage of the service. (see **Conclusions: 8.2.1 and 8.2.4.6**)

8.3.2.8 Other Recommendations for Libraries

- 1) Academic libraries should enhance timings for the provision of synchronous DRS and indicate the times at which the service is available on their websites. The libraries should answer queries through asynchronous DRS as quickly as possible, and mention response time on their websites. (see **Conclusion: 8.2.1**)
- 2) Academic libraries should develop FAQs regarding their policies and procedures, and place a link to the FAQs on their websites to answer policy and procedural questions. It will help them to reduce the workload of their reference staff handling DRS. (see **Conclusion: 8.2.3**)
- 3) Academic libraries should evaluate their DRS on a regular basis and make adjustments in their services keeping in view evaluation results. (see **Conclusion: 8.2.4.7**)
- 4) Academic libraries should subscribe to the important electronic reference and information resources (which are not provided by the NDL) keeping in view their users' information needs. (see **Conclusion: 8.2.4.5**)
- 5) Academic libraries should expand their existing DRS by introducing synchronous DRS through chat/IM, video-conferencing, VoIP to provide a more sophisticated DRS. (see **Conclusion: 8.2.3**)

- 6) Academic libraries should work in collaboration and develop a collaborative project for DRS in order to overcome their various problems. The libraries should adopt either of the two models proposed in section 7.12 for setting up a collaborative digital reference project. (see **Conclusion: 8.2.7**)

8.3.3 Recommendations for Library Schools and Professional Associations

- 1) Library schools and professional associations should organise seminars and workshops to create awareness about importance of DRS among LIS professionals in the country. (see **Conclusion: 8.2.4.4**)
- 2) Library schools, professional associations and other institutions working for the development of libraries in the country, such as the Federal Department of Libraries, Punjab Library Foundation should conduct training courses on DRS and ICT for LIS professionals to improve their ICT skills, and train them in various techniques of the DRS. (see **Conclusion: 8.2.4.4**)
- 3) Library schools should redesign their courses on reference service by incorporating some important topics related to DRS, such as concept and development of DRS in libraries, introduction to basic types of DRS and technologies used for DRS, techniques required to handle various forms of DRS, online interviewing skills, database and online searching, electronic reference resources, important websites, etc. in order to equip the future librarians with necessary knowledge and skills to manage the DRS. The courses should be designed to provide practical training on various aspects of the DRS. (see **Conclusion: 8.2.4.4**)
- 4) Library schools should include more ICT-based courses in their curricula and make the ICT-based courses practical oriented in order to develop ICT skills of the future LIS professionals. (see **Conclusion: 8.2.4.4**)

8.4 Areas for Further Research

The study has opened up different avenues of further research. The following are some suggested areas of further research in this regard:

1. A study regarding user perception of, and satisfaction with, DRS in academic libraries in Pakistan be carried out.
2. A study be conducted to assess the practicality of a collaborative digital reference project among academic libraries in Pakistan.

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Appendix A: Questionnaire for Survey (Print Version)

Digital Reference Services in University Libraries of Pakistan

This survey is conducted as part of the research project of a PhD student from the Department of Information Science at Loughborough University, UK. With the advent of the Internet and World Wide Web, many modern academic libraries have started using digital technologies, such as e-mail, Web form, Web chat, instant messaging (IM), Voice over Internet Protocol (VoIP), video-conferencing, to provide reference services, called digital reference, to their users. The aim of this survey is to explore the status of digital reference services in university/degree awarding institution libraries in Pakistan.

The survey is designed to collect data from all Pakistani university/degree awarding institution libraries whether or not they have implemented digital reference services. The information gathered through this survey is very important to the success and outcome of the research. The outcome of this research will assist Pakistani university/degree awarding institution libraries to implement and manage digital reference services effectively and efficiently by keeping pace with the latest trends and technological innovations.

Definitions and explanations of words marked with asterisk (*) are given at the end of each question. All data collected in this survey will be held anonymously and securely.

You can print out this questionnaire and fill it out in black or blue ink. After completing the questionnaire, please send its scanned copy as an email attachment to M.Younus@lboro.ac.uk

For any enquiry or comment related to the survey, please contact the researcher by e-mail at M.Younus@lboro.ac.uk

Section 1: Information about the Library

This section contains a few questions regarding general information about your library.

1. Name of the university library: _____

2. Category of the university library:

- General Engineering Health Sciences Agriculture/Veterinary
 Business/I.T. Art/Design Other (please specify): _____

3. Sector:

- Public Private

4. Province/Region: _____

5. Year of establishment of the library: _____

6. Number of staff in the library: (Please answer all that apply)

Professional: _____ Para-professional: _____
Clerical: _____ Other (please specify): _____

7. Total library collection in volumes*: _____

***Including bound volumes of periodicals.**

8. What are the main user groups* of the library? (Please tick all that apply)

- Students Research staff Academic staff Administrative staff
 Other (please specify): _____

***Users whose information needs are fulfilled by the library.**

9. Total number of library members: _____

10. Does your library have a web-site?

- Yes No

a. If yes, what is the URL of your library? _____

Section 2: Reference Services

In this section, a few questions regarding status of reference services in your library are asked.

11. Does your library contain reference materials?

- Yes (please answer the following questions a & b) No (please go to question 12)

a. If yes, in which form does your library contain reference materials? (Please tick all that apply)

- Print Electronic Other (please specify): _____

b. What is the total number of reference collection* in volumes in your library? _____

*** Including all forms.**

12. Does your library have a staffed reference desk?

- Yes No

13. Does your library have designated reference staff?

- Yes (please go to question 14) No (please go to question 15)

14. What is the number of designated reference staff working in your library? (Please answer all that apply)

Professional: _____ Para-professional: _____ Other (please specify): _____

15. Which of the following types of reference services does your library provide to users?

a. Information

Yes No

If yes, please indicate which of the following information services does your library provide to users? *(Please tick all that apply)*

- | | |
|--|---|
| <input type="checkbox"/> Quick/Ready reference service | <input type="checkbox"/> Bibliographic verification |
| <input type="checkbox"/> Query answering service | <input type="checkbox"/> Selective dissemination of information |
| <input type="checkbox"/> Database searches | <input type="checkbox"/> Other <i>(please specify)</i> : _____ |

b. Instruction

Yes No

If yes, please indicate which of the following methods does your library adopt to provide instruction to users? *(Please tick all that apply)*

- | | |
|--|---|
| <input type="checkbox"/> Orientation tours | <input type="checkbox"/> Induction sessions |
| <input type="checkbox"/> Information literacy sessions | <input type="checkbox"/> Printed guides and handouts |
| <input type="checkbox"/> Mediated searches*1 | <input type="checkbox"/> Audiovisual presentations |
| <input type="checkbox"/> Web-based guides and handouts | <input type="checkbox"/> Course-integrated instructions*2 |
| <input type="checkbox"/> Other <i>(please specify)</i> : _____ | |

c. Guidance

Yes No

If yes, please indicate which of the following guidance services does your library provide to users? *(Please tick all that apply)*

- | | |
|--|---|
| <input type="checkbox"/> Reader's advisory services | <input type="checkbox"/> Research assistance and consultation |
| <input type="checkbox"/> Other <i>(please specify)</i> : _____ | |

***1 A systematic search in which a trained librarian assists the end-users in locating desired information by helping to formulate and execute strategies for searching online catalogs and databases, and by using traditional bibliographical tools.**

***2 Instructions provided as a part of university courses.**

16. How does your library provide reference services to users? *(Please tick all that apply)*

- | | | |
|--|--|--|
| <input type="checkbox"/> Not provided by the library | <input type="checkbox"/> Face -to-face consultation | <input type="checkbox"/> Through telephone |
| <input type="checkbox"/> Through fax | <input type="checkbox"/> Through correspondence*1 | |
| <input type="checkbox"/> Digital reference*2 | <input type="checkbox"/> Other <i>(please specify)</i> : _____ | |

***1 Through postal/mail-delivery service.**

***2 Digital reference is reference service offered online or through any of electronic Means, such as e-mail, Web form, Web chat, instant messaging (IM), Voice over Internet Protocol (VoIP), video-conferencing.**

17. On average, how many reference queries does your library answer in a week through the following? *(Please answer all that apply)*

	Number of reference queries answered in a week
Face-to-face consultation	
Telephone	
Fax	
Correspondence	
Digital reference services*	
Other <i>(please specify)</i> : _____	

Section 3: Digital Reference Services

In this section, a few questions regarding implementation of digital reference services*, and different aspects related to management of digital reference services in your library are asked.

18. Does your library offer digital reference services*?

- Yes **(please go to question 19)**
 No **(please answer the following questions a & b and then go to section 5)**

a. If no, why have you not started offering digital reference services so far? *(Please tick all that apply)*

- Not aware of digital reference services Lack of resources Lack of skilled staff
 No staff time to run a new service Financial constraints No users' demand
 Other *(please specify)*: _____

b. Are you planning to start digital reference services in your library?

- No Yes, in less than 6 months Yes, in 6-12 months
 Yes, in more than 1 year Yes, not sure when
 Other *(please specify)*: _____

*** Digital reference services are reference services offered online or through any of electronic means such as e-mail, Web form, Web chat, instant messaging (IM), Voice over Internet Protocol (VoIP), video-conferencing, etc.**

NOTE: If you answered "No" to question 18 above, please go on to section 5

19. For how long has your library offered digital reference services?

- Less than 6 months 6-12 months 1-2 years
 2-5 years More than 5 years
 Other (*please specify*): _____

20. Does your library have a policy regarding digital reference services?

- Yes No

21. Which of the following formats does your library use to offer digital reference services to users? (*Please tick all that apply*)

- E-mail reference Web form
 Frequently Asked Questions (FAQs) Web chat
 Instant messaging (IM) Voice over Internet Protocol (VoIP)
 Video-conferencing Collaborative digital reference*
 Other, (*please specify*): _____

***Digital reference services offered with the collaboration of two or more libraries.**

22. If your library offers digital reference services through collaborative digital reference, what is the name of the collaborative service of which your library is a member? (*Optional*)

23. On average, how many digital reference transactions does your library handle in a week in the following formats? (*Please answer all that apply*)

Format	Number of digital reference transactions handled in a week
E-mail reference	
Web form	
Web chat	
Instant messaging (IM)	
Voice over Internet Protocol (VoIP)	
Video-conferencing	
Collaborative digital reference	
Other(<i>please specify</i>): _____	

24. What is the target/turnaround time to answer a reference question through the following formats in your library? *(Please answer all that apply)*

Format	Target/ Turnaround time to answer a reference question
E-mail reference	
Web form	

25. What are service hours for digital reference through the following formats in your library? *(Please answer all that apply)*

Format	Services hours for digital reference per working day
Web chat	
Instant messaging (IM)	
Voice over Internet Protocol (VoIP)	
Video-conferencing	
Collaborative digital reference	
Other <i>(please specify)</i> : _____	

26. Which of the following types of reference questions are answered through digital reference in your library? *(Please tick all that apply)*

- Directional Procedural Quick/Ready reference Specific search
 Reader's advisory Research Other *(please specify)*: _____

27. Which of the following types of reference resources does your library use to answer reference queries through digital reference services? *(Please tick all that apply)*

- Print reference resources Licensed or fee-based digital reference resources
 Free Web-based reference resources In-house electronic reference resources
 Your library catalogue Catalogues of other libraries
 Other *(please specify)*: _____

28. Who does handle digital reference transactions in your library? *(Please tick all that apply)*

- Reference staff
 Para-professional staff
 Highly skilled library staff devoted to digital reference
 Other *(please specify)*: _____

29. In which of the following settings have your reference staff received formal training on ICT and digital reference services? *(Please tick all that apply)*

- Professional degree program Continuing education classes Self-taught
 In-service training sessions Software vendors Colleagues
 Other *(please specify)*: _____

30. To whom does your library offer digital reference services? *(Please tick all that apply)*

- Students Research staff Academic staff Administrative staff
 Other *(please specify)*: _____

31. How are users made aware of digital reference services offered by your library? *(Please tick all that apply)*

- Library web site Information literacy sessions Training
 Guidance Library's promotional activities Other *(please specify)*: _____

32. Does your library archive digital reference questions and answers?

- Yes No

33. Do you evaluate digital reference services offered by your library on a regular basis?

- Yes No

a. If yes, which of the following methods does your library adopt to evaluate digital reference services? *(Please tick all that apply)*

- Users' feedback/survey Analysis of question logs
 Review of transcripts Other *(please specify)*: _____

34. Does your library have a Web OPAC?

- Yes No

a. If yes, which of the following interactive services does your library offer to users through the Web OPAC? *(Please tick all that apply)*

- Selection of books Loan status check
 Renewal of loans Reservation of books
 Inter library loan Fine accrued
 Suggestions for books New acquisition/arrivals
 Other *(please specify)*: _____

35. Does your library provide online access to the following resources? *(Please tick all that apply)*

- | | |
|--|---|
| <input type="checkbox"/> No access provided | <input type="checkbox"/> Electronic books |
| <input type="checkbox"/> Electronic journals | <input type="checkbox"/> Internet resources |
| <input type="checkbox"/> Online databases | <input type="checkbox"/> Other libraries' Web OPACs |
| <input type="checkbox"/> Other <i>(please specify)</i> : _____ | |

Section 4: ICT Infrastructure for Digital Reference Services

This section contains a few questions regarding ICT infrastructure developed and used for digital reference services in your library.

36. What is the number of computer terminals used for handling digital reference services in your library? _____

37. Who is the Internet Service Provider (ISP) for your library? _____

38. What is the access type of the Internet in your library? _____

39. What is the level of Internet access (Bandwidth) in your library? _____

40. Does your library use any software product for Web chat/Instant Messaging (IM) to provide digital reference services?

- Yes **(please go to question 41)**
 No **(please go to question 44)**

41. What is the name of software product used for Web chat/Instant Messaging (IM) in your library? _____

42. Please indicate under which of the following categories does Web chat/Instant Messaging software product used by your library fall?

- Free
 Commercial/Fee-based
 Other *(please specify)*: _____

43. Please indicate which of the following features does Web chat/Instant Messaging software used in your library have? (Please tick all that apply)

- | | | |
|--|--|--|
| <input type="checkbox"/> Library specific | <input type="checkbox"/> Accessibility | <input type="checkbox"/> Ability to save transcripts |
| <input type="checkbox"/> Ability to keep statistics | <input type="checkbox"/> Queuing or routing of users | <input type="checkbox"/> Ability to customise |
| <input type="checkbox"/> Page pushing*1 | <input type="checkbox"/> Escorting*2 | <input type="checkbox"/> Co-browsing*3 |
| <input type="checkbox"/> User interface | <input type="checkbox"/> Ability to share services | <input type="checkbox"/> Easy to use and set up |
| <input type="checkbox"/> Ability to have more than one staff member logged in simultaneously | | |
| <input type="checkbox"/> Ability to keep users anonymous | | |
| <input type="checkbox"/> Other (please specify): _____ | | |

***1 Page pushing allows the librarian to send the Internet pages from the library's browser to the user's browser.**

***2 Escorting enables the user to follow navigation process demonstrated by the librarian.**

***3 Co-browsing engages both the librarian and the user in navigation process simultaneously.**

44. Where is the link to digital reference services placed on your library web site?

- | | | |
|--|---|---|
| <input type="checkbox"/> Home page | <input type="checkbox"/> Under services | <input type="checkbox"/> Under contact us |
| <input type="checkbox"/> Other (please specify): _____ | | |

45. Where can digital reference services offered by your library be accessed from? (Please tick all that apply)

- | | | |
|------------------------------------|--|--|
| <input type="checkbox"/> On-campus | <input type="checkbox"/> Off-campus/remotely | <input type="checkbox"/> Other (please specify): _____ |
|------------------------------------|--|--|

46. Are user identification (ID) and passwords required to access digital reference services offered by your library?

- | | |
|------------------------------|-----------------------------|
| <input type="checkbox"/> Yes | <input type="checkbox"/> No |
|------------------------------|-----------------------------|

47. Where is the workstation for digital reference services located in your library?

- | |
|--|
| <input type="checkbox"/> At traditional reference desk |
| <input type="checkbox"/> At a separate desk/place devoted to digital reference |
| <input type="checkbox"/> Other (please specify): _____ |

48. Who does manage and maintain ICT facilities for digital reference services in your library? (Please tick all that apply)

- | | |
|---|--|
| <input type="checkbox"/> Library staff | <input type="checkbox"/> ICT experts within the university |
| <input type="checkbox"/> ICT experts outside the university | <input type="checkbox"/> Other (please specify): _____ |

Section 5: Perceptions about Digital Reference Services

In this section, you are asked about your experience with and opinions about digital reference services. Please answer all questions of this section whether or not your library offers digital reference services to users.

49. Please give your opinion as to how well the following types of reference questions can be answered through digital reference services. *(Please tick the appropriate box)*

Type of reference questions	Well served by digital reference	Poorly served by digital reference	Neither well nor poorly served	No opinion
Quick/Ready reference questions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Detailed, research questions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reader's advisory questions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Directional questions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Procedural questions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

50. Please give your opinion regarding suitability of the following formats of digital reference for answering different types of reference questions. *(Please tick all that apply OR select "No opinion")*

Format of digital reference	Quick reference questions	Detailed research questions	Reader's advisory questions	Directional questions	Procedural questions	No Opinion
E-mail reference	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Web form	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Frequently Asked Questions (FAQs)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Web chat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Instant messaging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Voice over Internet Protocol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Video-conferencing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Collaborative digital reference	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

51. To what extent do you agree or disagree with the following with regard to the advantages of digital reference services? *(Please tick the appropriate box)*

1 Strongly disagree

2 Disagree

3 No opinion/Neutral

4 Agree

5 Strongly agree

Advantages	1	2	3	4	5
a. It provides faster access to information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. It saves time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. It is convenient to offer to users	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. It gives more time for thought and reflection on part of librarian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. It helps to provide a more complete answer to users	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. It motivates users to use library and its resources more effectively and efficiently	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. It provides new options for answering reference questions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. It is more a personalized service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. It helps to distribute workload among staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. It provides answers to questions asked from any location at anytime	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. It helps to save chat session text which can be used later by both librarian and user	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l. It is more efficient and cost-effective than traditional reference service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m. It allows staff to be physically flexible as they can answer queries from anywhere	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n. It is easy to access as users need not come to library physically	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Advantages	1	2	3	4	5
o. It extends service hours up to 24 hours a day, 7 days a week	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
p. It feels like a live reference transaction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
q. It is beneficial for particular users, e.g. distance learners, users with hearing and speaking impairments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
r. It provides opportunity for interactive learning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

52. Please indicate your opinion about every statement from the following regarding disadvantages of digital reference services. *(Please tick the appropriate box)*

1 Strongly disagree
4 Agree

2 Disagree
5 Strongly agree

3 No opinion/Neutral

Disadvantages	1	2	3	4	5
a. It is difficult to offer to users	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. It takes longer time to handle a reference transaction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. It has increased the workload of reference staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. It makes the reference interview difficult to conduct	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. It provides limited explanation to users	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. It makes reference transactions impersonal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. It does not allow for non-verbal communication between the user and the librarian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. It requires reference staff to be trained in the Internet and ICT skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. It causes information overload	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. It requires special infrastructure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Disadvantages	1	2	3	4	5
k. It increases users' expectations as they wish to have an instant and efficient response to their queries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l. It is more expensive than traditional reference service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m. It makes users' information needs difficult to understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n. Complex queries cannot be answered satisfactorily or not at all through digital reference	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
o. It causes misinterpretation of things due to limited communication	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section 6: Issues Regarding Digital Reference Services

In this section, you are asked about the issues and problems with which your library is faced in implementing and managing digital reference services.

53. To what extent do you think the following issues/problems are affecting the implementation and management of digital reference services in your library? *(Please tick the appropriate box)*

- 1 Not at all 2 Minor extent 3 Undecided 4 Moderate extent
5 Major extent

Issues/Problems	1	2	3	4	5
a. Lack of resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Financial constraints	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Lack of planning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Shortage of competent and skilled library professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Lack of ICT facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Unavailability of suitable software for digital reference	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Lack of ICT application	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Shortage of digital library collection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Lack of training facilities for library professionals in the country	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Issues/Problems	1	2	3	4	5
j. Inadequate physical facilities in library	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. Low speed of the Internet in the country	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l. Power crisis in the country	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m. Lack of interest on part of library staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n. Unavailability of policy regarding digital reference service in library	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
o. Lack of evaluation of the service in library	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
p. Lack of research and literature in this area in the country	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

54. Please provide further information regarding any other issues and problems hindering implementation and management of digital reference services in your library. *(Optional)*

Would you be interested in being interviewed to discuss status of digital reference services, and issues regarding implementation and management of digital reference services in your university library?

Yes No

If yes, please provide your contact information as follows:

Name: _____ **Designation:** _____

Tel. #: _____ **Mob #:** _____

E-mail address: _____

Thank you for your time and cooperation

Appendix B: Covering Letter for Distribution of Questionnaires

**University Chief Librarian/Director/Head University Library/
Chief Librarian/Head/Director Degree Awarding Institution Library**

Online Survey on Digital Reference Services in University Libraries of Pakistan

Dear Sir/Madam,

I am a faculty member of the Islamia University of Bahawalpur, Pakistan. Currently, I am doing my PhD at the Department of Information Science at Loughborough University, United Kingdom. I am conducting a research study concerned with the implementation and management of digital reference services in university/degree awarding institution libraries in Pakistan.

The Internet and its associated technologies have affected tremendously both the way libraries provide information services to their users and the way the users access information. Academic libraries are required to be ever responsive to the changing information needs of their users by keeping pace with technological innovations. Many modern academic libraries throughout the world have started using different Web technologies, such as e-mail, Web form, Web chat, instant messaging (IM), Voice over Internet Protocol (VoIP), video-conferencing, to provide reference services, called '*digital reference*', to users. Digital reference service helps students and researchers tremendously in undertaking their studies and research by providing them with online assistance, and facilitates greatly distance education.

The aim of my research study is to investigate and analyze digital reference services in university/degree awarding institution libraries in Pakistan. The outcome of this research will help Pakistani university/degree awarding institution libraries to implement and manage digital reference services more effectively and efficiently by keeping pace with the latest trends and technological developments.

As one of various data collection methods for my research, I am conducting an online survey of all university/degree awarding institution libraries in Pakistan. You have been selected to take part in this survey because you are one of the prestigious heads of university/degree awarding institution libraries. You are requested to complete the online questionnaire for your library, whether or not you have implemented digital reference services in your library. Your contribution is valuable and essential to the successful completion of this research.

The online questionnaire is very simple (it requires just ticking/clicking the responses) and will take a few minutes to complete. It can be accessed through the following link:

<https://www.survey.lboro.ac.uk/drs-uni-pk/>

You are requested to fill in the online questionnaire yourself or you may get it completed by a staff member responsible for managing reference services/digital reference services in your library as early as possible as but not later than 25/10/2011.

The data collected will be analyzed and interpreted by the researcher himself and will be confidential, and will not be used other than academic purposes.

For further information, please contact the researcher by the e-mail at M.Younus@lboro.ac.uk

I would like to appreciate your time and cooperation in advance.

With best regards,

Yours sincerely

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<http://www.lboro.ac.uk/departments/dis/research/PhDstudents/Younis.html>

http://www.iub.edu.pk/teacher.php?dept_id=20&teacher_id=630

Appendix C: Reminder for completion of the Survey

**University Chief Librarian/Director/Head University Library/
Chief Librarian/Head/Director Degree Awarding Institution Library**

Reminder for Completion of Online Survey--Digital Reference Services in University Libraries of Pakistan

Dear Sir/Madam,

You are reminded of the aforementioned online survey which I sent you a few days ago. I have not yet received a response from your library. I most humbly request you to fill in the online questionnaire. It is very simple (it requires just ticking/clicking the responses) and will take a few minutes to complete. The questionnaire can be accessed through the following link:

<https://www.survey.lboro.ac.uk/drs-uni-pk/>

Your response and contribution matter a lot and are very essential for the successful completion of my research.

Without your contribution I cannot complete my research. So I request you to please complete this survey as early as possible.

I shall be highly grateful to you.

With best regards

Yours sincerely

Muhammad Younus
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Appendix D: List of University/Degree Awarding Institute Libraries which participated in the Survey

Universities/DAIs chartered by Government of Pakistan

Public sector

1. Air University, Islamabad
2. Allama Iqbal Open University, Islamabad (AIOU)
3. Bahria University, Islamabad
4. COMSATS Institute of Information Technology, Islamabad

5. Federal Urdu University of Arts, Sciences & Technology, Islamabad

6. Institute of Space Technology, Islamabad (IST)
7. International Islamic University, Islamabad
8. National College of Arts, Lahore (NCA)
9. National Defense University, Islamabad (NDU)
10. National Textile University, Faisalabad
11. National University of Sciences & Technology, Rawalpindi (NUST)

12. Pakistan Institute of Development Economics (PIDE), Islamabad

13. Pakistan Institute of Fashion and Design, Lahore
14. Quaid-i-Azam University, Islamabad

Private sector

15. Aga Khan University, Karachi
16. Foundation University, Islamabad
17. National University of Computer and Emerging Sciences, Islamabad

18. Riphah International University, Islamabad

Universities/DAIs chartered by Government of the Punjab

Public sector

19. Bahauddin Zakariya University, Multan
20. Fatima Jinnah Women University, Rawalpindi
21. Government College University, Faisalabad
22. Government College University, Lahore
23. Islamia University, Bahawalpur
24. Kinnaird College for Women, Lahore
25. University of Agriculture, Faisalabad
26. University of Arid Agriculture, Rawalpindi
27. University of Education, Lahore
28. University of Engineering & Technology, Lahore
29. University of Engineering & Technology, Taxila
30. University of Gujrat, Gujrat
31. University of Health Sciences, Lahore
32. University of Sargodha, Sargodha

33. University of the Punjab, Lahore
34. University of Veterinary & Animal Sciences, Lahore

Private Sector

35. Beaconhouse National University, Lahore
36. Forman Christian College, Lahore (university status)
37. Global Institute, Lahore
38. HITEC University, Taxila
39. Institute of Management Sciences, Lahore
40. Minhaj University, Lahore
41. The GIFT University, Gujranwala
42. The University of Faisalabad, Faisalabad
43. University of Central Punjab, Lahore
44. University of Lahore, Lahore
45. University of Management & Technology, Lahore

Universities/DAIs chartered by Government of Sindh

Public sector

46. Mehran University of Engineering & Technology, Jamshoro
47. NED University of Engineering & Technology, Karachi

48. Quaid-e-Awam University of Engineering, Sciences & Technology, Nawabshah
49. Shah Abdul Latif University, Khairpur
50. University of Karachi, Karachi

Private Sector

51. Baqai Medical University, Karachi
52. Dadabhoy Institute of Higher Education, Karachi
53. Indus Institute of Higher Education, Karachi
54. Indus Valley School of Art and Architecture, Karachi
55. Institute of Business and Technology, Karachi
56. Iqra University, Karachi
57. Jinnah University for Women, Karachi
58. Karachi Institute of Economics & Technology, Karachi
59. KASB Institute of Technology, Karachi
60. Muhammad Ali Jinnah University, Karachi
61. Newport Institute of Communications & Economics, Karachi
62. Preston Institute of Management, Science and Technology, Karachi

63. Shaheed Zulfikar Ali Bhutto Institute of Sc. & Technology (SZABIST), Karachi
64. Textile Institute of Pakistan, Karachi

Universities/DAIs chartered by Government of Khyber Pakhtoonkhwa

Public sector

65. Abdul Wali Khan University, Mardan

66. Gomal University, D.I. Khan
67. Institute of Management Science, Peshawar (IMS)
68. Islamia College University, Peshawar
69. Khyber Pakhtunkhwa Agricultural University, Peshawar
70. Kohat University of Science and Technology, Kohat
71. NWFP University of Engineering. & Technology, Peshawar

72. University of Malakand, Chakdara, Dir, Malakand
73. University of Peshawar, Peshawar
74. University of Science & Technology, Bannu
75. University of Swat, Swat

Private Sector

76. Abasyn University, Peshawar
77. CECOS University of Information Technology and Emerging Sciences, Peshawar
78. City University of Science and Information Technology, Peshawar

79. Ghulam Ishaq Khan Institute of Engineering Sciences & Technology, Topi
80. Qurtaba University of Science and Information Technology, Peshawar
81. Sarhad University of Science and Information Technology, Peshawar

Universities/DAIs chartered by Government of Balochistan

Public sector

82. Balochistan University of Engineering & Technology, Khuzdar

83. University of Balochistan, Quetta

Private sector

Nil

Universities/DAIs chartered by Government of Azad Jammu & Kashmir

Public sector

84. University of Azad Jammu & Kashmir, Muzaffarabad, Azad Kashmir, Muzaffarabad

Private Sector

85. Al-Khair University, Bhimber, AJ&K

Appendix E: Interview Schedule

Interview Schedule for Heads of University/Degree Awarding Institute Libraries in Pakistan

Digital reference, for the purpose of the research, is defined as:

Reference service provided through the Internet using digital technologies, such as e-mail, web-form, web-chat, instant messaging, Voice over Internet protocol, video-conferencing, to library users.

1. In your opinion, what is the importance of reference services in academic libraries in Pakistan? Please comment.
2. Which methods do you adopt to provide reference services to users in your library?
3. Does your library follow any policy or guidelines to provide digital reference service to users?
4. How do you maintain ICT infrastructure used for digital reference services in your library?
5. Do you provide any training to your library staff responsible for handling digital reference services in your library?
6. How much does it cost your library to manage digital reference services annually? Does your library have any specific amount allocated for management of digital reference services in its annual budget?
7. Do you have any difficulties in providing digital reference services to users?
8. How can these difficulties be overcome?
9. What are your future plans regarding digital reference services? Will you continue, expand or stop the service in your library?
10. What do you think should digital reference replace traditional methods of reference services, i.e. face-to-face consultation, telephone consultation, fax, correspondence completely or partially (in some specific areas), or should it be integrated with these traditional methods in academic libraries in Pakistan? Please comment.
11. How do you see the future development of digital reference services in university/DAI libraries of Pakistan?

- 12.**How long will it take for digital reference services to be developed and started in more academic libraries in Pakistan? What factors do you think will contribute to the development of digital reference services in these libraries?
- 13.**What is your opinion about the idea of setting up a consortium of university/DAI libraries for the provision of digital reference services in Pakistan? What are its prospects?
- 14.**How can member libraries share their time and resources to provide collaborative digital reference services through this consortium?
- 15.**Do you have any comments, suggestions and further details regarding implementation and management of digital reference services in university/DAI libraries in Pakistan, and any issue related to it?

Name:	Designation:
Tel. no.:	E-mail address:
Qualification:	Professional experience:
University/DAI Library:	
Date:	Time:
Venue:	

THANK YOU FOR YOUR TIME

Appendix F: Covering Letter for Interview

**University Chief Librarian/Director/Head University Library/
Chief Librarian/Head/Director Degree Awarding Institute Library**

Digital Reference Services in University Libraries of Pakistan---Interviews

Dear Sir/Madam,

I am a faculty member of the Islamia University of Bahawalpur, Pakistan. Currently, I am doing my PhD at the Department of Information Science at Loughborough University, United Kingdom. I am conducting a research study concerned with the implementation and management of digital reference services in university/degree awarding institute libraries in Pakistan.

The Internet and its associated technologies have affected tremendously both the way libraries provide information services to their users and the way the users access information. Many modern academic libraries have started using different digital technologies, such as e-mail, Web form, Web chat, instant messaging (IM), Voice over Internet Protocol (VoIP), video-conferencing, to provide reference services, called 'digital reference', to users.

The aim of my research study is to investigate and analyze digital reference services in university/degree awarding institute libraries in Pakistan. The outcome of this research will help Pakistani university/degree awarding institute libraries to implement and manage digital reference services more effectively and efficiently by keeping pace with the latest trends and technological innovations.

As one of various data collection methods for my research, I am conducting interviews of heads of leading university/degree awarding institute libraries in Pakistan to discuss some issues relating to the implementation and management of digital reference services, which will help enrich this study. You have been selected for this interview because you are one of the prestigious heads of leading university/degree awarding institute libraries in Pakistan. Your participation is valuable and essential to the successful completion of this research.

The data collected through interviews will be analyzed and interpreted by the researcher himself and will be confidential, and will not be used other than academic purposes.

For further information, please contact the researcher by e-mail at M.Younus@lboro.ac.uk

A list of questions for interview is attached herewith.

I would like to appreciate your time and cooperation in advance.

With best regards,

Yours sincerely

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<http://www.lboro.ac.uk/departments/dis/research/PhDstudents/Younis.html>

http://www.iub.edu.pk/teacher.php?dept_id=20&teacher_id=630

Appendix G: University/Degree Awarding Institute Libraries at which Interviews were conducted

The semi-structured interviews with heads of central libraries of the following universities/DAIs were conducted for this research:

1. Air University, Islamabad
2. Bahria University, Islamabad
3. Fatima Jinnah Women University, Rawalpindi
4. Forman Christian College, Lahore
5. Government College University, Lahore
6. International Islamic University, Islamabad
7. Islamia University, Bahawalpur
8. Pakistan Institute of Development Economics (PIDE), Islamabad
9. Quaid-i-Azam University, Islamabad
10. University of Central Punjab, Lahore
11. University of Engineering & Technology, Lahore
12. University of Gujrat, Gujrat
13. University of Management & Technology, Lahore
14. University of the Punjab, Lahore
15. University of Veterinary & Animal Sciences, Lahore

Appendix H: University Libraries at which the questionnaire was piloted

The online questionnaire was piloted with heads of central libraries of the following four universities:

- 1) University of the Punjab, Lahore
- 2) Government College University, Lahore
- 3) Allama Iqbal Open University, Islamabad
- 4) University of Sargodha, Sargodha