Forum for Education Studies 2024, 2(1), 380.
https://doi.org/10.59400/fes.v2i1.380

Article

Digital reference services in public university libraries in Rajshahi, Rangpur, and Khulna division

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CITATION

Akter NN. Digital reference services in public university libraries in Rajshahi, Rangpur, and Khulna division. Forum for Education Studies. 2024; 2(1): 380. https://doi.org/10.59400/fes.v2i1.380

ARTICLE INFO

Received: 1 December 2023
Accepted: 19 January 2024
Available online: 23 February 2024

Abstract: The development of information and communication technologies, the availability of information online, and the wide spread of the internet have changed the trends of library services. On the other hand, the user's attitudes towards the library change. The users want digitalized resources and online services. To serve information seekers, there is no other way than digital reference service. Digital Reference Service is the only way to give the right information to the right users at the right time. Digital Reference Service provides a user assistant when they want while sitting at home. University libraries are an important part and parcel of higher education, and the users of these libraries, such as students, faculty members, and researchers always involved in education. They will need any type of information or document at any time. To fulfill their requirement and to achieve their satisfaction, there is no alternative to Digital Reference Service (DRS). From this study, it is found that the mentality of library professionals has changed. They try hard to make the library digital and provide internet-based services. Public university libraries offer a large number of databases to meet the needs of users. Besides these, the university libraries offer online services like Current Awareness Service (CAS), Selective Dissemination of Information (SDI), institutional repositories, and so on. They faced some problems with providing DRS. This study provides some recommendations that will help them to run digital reference services smoothly.

Keywords: digital referencing; library management; public university; public library

1. Introduction

In Bangladesh, the university is considered the higher level of education, and it is such an important educational institution from where a large number of students, faculty members, and research scholars do their research works to develop their personal lives, solve social problems, and invent new ideas for economic development as well as the whole development. For higher education, there is no alternative without a library. Thus, a library is considered the "heart" of a university, and it is the center of learning. With the change of time, the role of the library is changed. Library works are not limited to acquisition, processing, and circulation. At present, library staff have to interact with users in a personal way to provide the best services. In this regard, reference service is essential to communicating with users. According to Ranganathan [1], "The process of establishing contact between a reader and his document in a personal way". He further stated that reference service is a personal service to each reader in helping him to find the documents, answering his interest at the moment pin-pointedly, exhaustively, and expeditiously. The Reference and User Services Association [2] of the American Library Association has been a leader in formulating standards for reference service. RUSA issued a guideline for the development and delivery of reference services. The guidelines state that "Information services in

libraries take a variety of forms, including direct personal assistance, directories, signs, exchange of information culled from a reference source, reader's advisory service, dissemination of information in anticipation of user needs or interests, and access to electronic information" [3]. Traditional reference services were transformed into modern reference services by the rapid development of ICT. "The introduction and development of the internet and its associated web technologies in the past decade have significantly influenced both the way libraries provide information services to their users and the way users choose to access information" [4]. The academic libraries are trying hard to meet the demands of the users both in traditional and digital form. But the users' mentality has changed with the invention of technology. The users want to search and access library materials whenever they want and from anywhere they want.

With the exploration of information, the term "information hallucination" arises. Whenever we do any type of study or research work on higher education, we face many problems in finding relevant information. Rapid development in higher education has increased the demand for digital reference services. For academic purposes, research works, or any other reasons, the user feels the need for information at any time, but he/she may not find the actual information at the time when he/she needs it. In this situation, a digital reference service can help him/her find the actual information. Academic libraries now offer their services online, and users can get the information by using simple technologies like smartphones, notebooks, tabs, or computers with internet connections. Libraries also provide services through e-mail, chat references, Facebook, Ask-A-Service, FAQs, and so on. With the help of these tools, the reference librarian provides relevant information to the right user, at the right time, in the right way. The nature of digital reference services can help the librarian to understand the urgency of information seekers almost accurately. Thus, the librarian can provide faster service to the user. In the past two decades, academic libraries have faced a huge change both in resources and services. Libraries have transformed into a new era with the help of technology. The emergence of the information superhighway has challenged academic libraries to provide online services to university library users. Nowadays, more and more academic libraries are developing their own websites. In Bangladesh, 41 public universities have their own websites, as well as libraries. But most of them are not providing online reference services. Most of them did not provide digital reference services. Online facilities like OPAC search, digital resources, dedicated websites, FAQ pages, and remote access resources are not available. The libraries have websites that do not work properly. Some libraries take the initiative to make libraries digital, but there is a gap. At present, around 400,000 students are studying at the graduation level in Bangladesh, and many students are also enrolled in Master's level education (Prof. Dr. Md. Akhtar Hossain, Awareness program on UGC Digital Library, 18 January 2018, Daffodil International University). 32 public universities out of 41 have membership in the UGC Digital Library (UDL). The libraries are getting access to more e-books and e-journal databases like Emerald Insight, JSTOR, IEEE, and ACM. Public university students, faculties, and researchers can access those databases on the university server. Maximum students are not aware of these databases; only researchers have an idea about these databases, and most of the faculty members know about this. In this situation, the library can play a vital role

in making every student, faculty, and researcher aware of those databases. The libraries can do this by interacting personally with all the members of the university. Now the question is how to interact with each member of the university. Yes, it is possible to communicate with all members if the communication channels are online. Every member of a public university can access the internet for free. Almost most of the students, faculties, and researchers go online every day for their academic studies, recreation purposes, research work, or other reasons. In this regard, there is no alternative to digital reference services.

Through digital reference services, the reference librarian interacts with many users at a moment; he can not only communicate with the users but also provide a clear concept of how to find technically accurate documents from huge databases. For higher study, the library is the core institute for finding accurate documents. Although so much research has been conducted on digital reference services globally. But it is a new phenomenon in Bangladesh. At present, many private universities have adopted this service, but public universities are not highly conscious of the emerging library services and techniques in this field. The present study tries to figure out the present scenario of public university libraries in Bangladesh. The research is also an attempt to know what types of reasons or barriers libraries face for offering digital reference services. However, in Bangladesh, university libraries are not fully aware of the service. Our planners need to consider this use urgently and take the initiative to arrange digital reference services in all academic libraries.

2. Research questions and objectives

A research question is the fundamental core of a research study. It focuses on the study, fixes the methodology, and guides in all stages of inquiry and analysis. Research questions are the problems to be solved through study. The research questions for this study were:

1) Which e-resources are available for DRS?
2) Which reasons are considering for providing DRS?
3) In which areas is DRS provided and what types of queries do the library professionals face?
4) What types of legal issues and challenges did the library professionals face in providing DRS?

The key objective of this study is to explore the present scenario of DRS of public university libraries in Rajshahi, Rangpur, and Khulna divisions regarding digital reference services. The specific objectives of the study are as follows:

1) To examine the rationality behind providing digital reference services.
2) To explore the techniques that are followed to provide digital reference services by public university libraries.
3) To express the challenges and limitations that are faced by public university libraries in Bangladesh.
4) To develop a plan for designing digital reference services in public university libraries.

3. Literature review

This study investigated a detailed literature survey on the selected topic by searching ELSEVIER, Emerald Insight, JSTOR, Google Scholar, ERIC (Education Resources Information Center), UA Campus Repository, University of Arizona, AARL, Press.jhu.edu, and ACRL from 1998 to 2023. After reviewing, references were selected, recorded, and stated as follows:

3.1. Studies on digital sources

Chakrabarti and Mandal [5] studied "Open access digital reference sources for the public library: An appraisal". This paper showed that the open access repository, The Directory of Open Access Repository (DOAR), Registry of Open Access Repository (ROAR), Directory of Open Access Books (DOAB), and Directory of Open Access Journals (DOAJ), could be used as an open access digital reference source and also might be useful for providing digital reference services for public libraries. This paper showed that digital-source e-books and e-journals are in different fields. However, this paper showed only the effectiveness from an Indian perspective and the resources also available in the Indian language. Sutradhar and Das [6] did a study on "Digital collection development through digital reference sources in public libraries of West Bengal: A proposed model". They highlighted that public libraries should take a forward step towards digital reference sources. The public library serves a large number of general people, so a well-defined online as well as offline digital reference source has to be built for its users. The research motto was to make a model of digital collection development through digital reference sources. They only discussed the digital reference source but did not show the application and required technologies.

Karati [7] explained an article on "Role of public libraries for collection development of digital reference sources in LIS environment". He showed that digital reference sources help the students, faculty members, and researchers in their respective fields and also could be used for the development of society. This paper showed the needs, effectiveness, and how to develop library and information science using digital sources and the internet. Modak [8] studied "Free digital reference sources: Prospects of reference services in the public library of West Bengal". He showed the online free reference sources for the people of West Bengal. He used secondary data and various search engines for collecting data. He said that the librarians should use the free websites and make a link to their library website to give better reference service. Bera [9] works on "Digital information sources: Characteristics and services". This paper showed characteristics of digital information sources, generic digital information resources, the domain of digital resources, access tools, and what are the services that could be given by digital information, the gold path of open access, i.e., Wikipedia, the green path, i.e., OA archives, and how to evaluate digital resources. He did not show the role of librarians to aware users of the resources provided by the library. Saha [10] examined "Selection and evaluation of digital reference resources towards collection development in a Library". The main motto of this paper was to set a planned procedure for getting new materials in digitalized form. She mentioned digital reference sources, the collection development

policy for digital resources, and the and the selection and evaluation process. She also mentioned that the selection and evaluation process should be based on IFLA guidelines.

Bhattacharya [11] presented a paper on "Collection development of digital reference sources: A case study of Visva-Bharati library system". He showed the importance of library digitalization for developing society. He presented the scenario of the Visva-Bharati University Library system. He discusses library resources, institutional repositories, and e-infrastructure. Their digitalizing system regarding their DRS and their user's teaching program. Pal [12] stated in "Management of digital reference resources: An overview". This paper showed the importance of digital resources and the LIS professionals' responsibilities. He stated the importance of digital reference in libraries, its limitations, and the management process. The article did not show the application of technologies, approximate budget, number of manpower, and the main thing of how-to-aware procedures of users for using authentic digital reference resources. Ghosh and Mondal [13] highlighted "Wikipedia as a digital reference source in public libraries of India". The article discussed that Wikipedia could be used as a reference tool in public libraries in India. In developing countries, digital reference is costly, so Wikipedia can help by providing free reference service. This paper showed the key roles of Wikipedia in providing reference services and mentioned that a partnership between public libraries and Wikipedia could be fruitful for users. This article provided some suggestions for librarians to utilize Wikipedia as a reference source.

3.2. Studies on digital reference services

Kumar [14] studied "Digital reference services and its sources: An evolution". This article showed a clear concept of DRS and its origin and also the gradual development of DRS with its sources like catalogs, information retrieval, etc. This paper also tried to discuss collaborative DRS. However, this paper did not show the present status of DRS in libraries. Das et al. [15] highlighted "Providing digital reference services through NetajiSubas Open University study concerns Prospect and proposals". In this study, they showed that the NSOU library had a large number of collections and also had virtual reference sources. They proposed a model for providing virtual reference services. They mentioned the prerequisites and procedures for developing their proposed model and plan also in the study. Paramanik and Syuhlo [16] described in the article "Virtual reference service for web-based information seekers". This paper focused on information seekers, the origin of virtual reference services, methods, and why virtual reference is important in web-based library systems. This article also showed how users got help from virtual reference services and why this service is becoming popular day by day. Porel and Khan [17] studied "Emergent challenges for protecting personally identifiable information: privacy and confidentiality in digital reference service". The study was done on 45 public libraries by observing their website. This paper found which services were facilitated by the libraries, what types of personal information were needed for getting those services, and the privacy policy that was facilitated by the libraries. Chattopadhyay and Mukhopadhyay [18] carried out a study on "Digital reference service using e-

resources: A study at St.xavier's College central library, Kolkata". This paper represents the difference between electronic resources and traditional resources. The necessity of DRS in academic libraries is shown here. The paper highlighted the reference librarian and how the librarian provided services to St.xavier's college students. The library provided DRS with a library feedback form, web OPAC service, dedicated websites, FAQs page, etc. This paper showed the future of DRS and the major constraints for providing this service.

Aditya [19] focused on writing "Digital reference service: an overview". This study analyzed definitions, key components of DRS, and its modes. This paper discussed the relationship between social networks and DRS and the use of collaborative digital reference services. Implementation of DRS in libraries, maintenance, and proceeding. Lee [20], "Do virtual reference librarians dream of digital reference questions: A qualitative and quantitative analysis of e-mail and chat reference". The article discussed the synchronous mode, i.e., chat reference, and the asynchronous mode, i.e., e-mail. This study discussed the benefits and demerits of chat references and e-mail. The article also discussed the limitations of virtual reference services. Vakkari [21] explained, "Comparing Google to a digital reference service for answering factual and topical requests by keyword and question queries". The purpose of this study was to find out to what extent Google provided reference services like factual and topical, Ask-A-Librarian services. The study tried to evaluate search engines. Fields [22] explained his opinion on "A unique Twitter use for reference services". He said that in a Web 2.0 environment, libraries can interact with their users in real time. And now many libraries use Twitter for different purposes. He mentions that Twitter could be used for conversations with users, and their queries could be solved in just time. According to him, Twitter was meant for discussion, not for broadcasting library services. Joint [23] discussed "Virtual reference, second life, and traditional library inquiry services: ANTAEUS". The paper focused on the virtual reference service, which was called a new life of the library. The paper finds out the weaknesses faced by the libraries when replacing reference services with virtual ones. The article showed that the invention of technologies made the reference desk dusty and the virtual reference service more fruitful. Vijayakumar and Vijayakumur [24] discussed "Digital reference service: Libraries online 24/7". This study discussed that the internet had a great influence on digital reference services and the role of librarians in making a proper way so that the users get the document in a virtual environment. This paper provides a plan for organizing quality digital reference services. Another article on "The future of reference: point of need reference service: point of need reference service: No longer an afterthought" [25]. This article focused on the work of a reference librarian. According to this article, the reference service is not limited only to the desk where the user comes and asks their queries. Technology has made the service out of the desk and the work of reference librarians more sophisticated.

A study on "Managing the reference desk online" conducted by Sennema [26] highlighted that the three web-based tools, i.e., Ask-A-Librarian, Refblog, and Reference Desk Schedule, help the librarian to quickly answer the users' questions. Sennema also mentioned that. These services provide e-mail service and help the librarian to share ideas easily and make relations with each other. A paper on "Digital reference: Training and assessment for service improvement" is stated by Kawakami

and Swartz [27]. The papers assess two universities, i.e., the University of California and Los Angeles digital reference programs, and the gap of the staff in doing their job. The main objective of this paper was to identify and assess the error as a user's error and the network error as a software error. This paper showed what the staff faced and what should be done for providing better reference service. Pomerantz et al. [28] studies on "Digital reference triage: An investigation using the Delphi method into the factors influencing question routing and assignment". The article described the Delphi method to determine the factors that affected the process of giving electronically reference services. Fifteen factors were selected to conclude the study. The article had laid out a methodology for evaluating other digital library services. McClure et al. discussed "Statistics, measures and quality standards for assessing digital reference library services: guidelines and procedures". This paper showed a complete scenario of DRS. They showed what types of queries were received, how to answer them, how to get user satisfaction, and the role of the librarian. The most vital elements of DRS are cost and staff. They analyzed these elements and guided for the best services. They also discussed peer review, enhanced reference transaction logs, and stated that the librarians should make a discussion group to find their shortcomings and improve their service quality.

Stemper and Butler [30] studied "Developing a model to provide digital reference services". They mentioned that before applying DRS, an organizational model is required for implementation. They also mentioned that the University of Minnesota-Twin Cities libraries had implemented a model for providing DRS for all students, faculty members, and staff who access remotely. Through Info Point, they provided 30 reference and referral services remotely. The article on "Building and maintaining digital reference services" by Wasik [31] stated that the invention of the internet had made libraries a step ahead. Through the internet, the libraries can offer their services online, and users could get them from anywhere. The paper showed the gradual development of DRS, how it works, and how to implement it. The author clearly showed how Ask-A-Service works and what the barriers are to this service. The paper showed a clear scenario of how to build and maintain DRS.

3.3. Studies on DRS in digital library environment

Buckland [32] discussed "Reference library service in the digital environment". They discussed that traditional reference services were served from 9.00 to 5.00, but if these services were provided by any digital library, the virtual reference librarian, like a computer or reference robot, could provide the service anytime. This paper has a message that over 30 years' libraries were trying to empower their reference librarians by providing reference services, and if reference services were given through digital libraries, it helped the librarian to empower his/her quality for providing better services. Choi [33] studied "Reference services in digital collections and projects". The main purpose of this study was to determine to what extent digital libraries provided remote services by building rich collections. The paper showed that the libraries can provide a rich number of digital reference services and also provide valuable information that is needed. The libraries are now creating man-to-man profiles so that they could know about users and can give accurate service. Jeffrey [34]

did a study on "Integrating digital reference service into the digital library environment". He stated that in a digital library environment, a librarian could gather what reference services were previously given so that it made directions for the next reference services. The librarian found it helpful if the works were integrated so the librarian could understand what types of queries could be arising. The main advantages of reference services in digital libraries were that collection development could be made easily, so the reference services were given in all aspects. Chowdhury [35] studied "Digital libraries and reference services: present and future". The paper showed that the trends in digital libraries are to build their collections and preserve resources. He mentioned that digital libraries did not emphasis in improving better reference services. In web-based society, some commercial and non-profit organizations gave reference services. But if the digital library provided reference services, the users would get the authentic information, and they could get the services when they needed. Sloan [36] studied "Service perspectives for the digital library remote reference services". The study made a relation between the librarian and the user when they interact with each other from a distance. He also discloses that in a digital environment, it was easy for the librarian to help the user when he/she needed information remotely. The librarian can categorize queries that arise from the users, and by using different software, the librarian can provide services 24 × 7.

3.4. Studies on DRS in collaborative library services

Weak and Luo [37] studied "Collaborative virtual reference service: Lessons from the past decade". They found that while working in a collaborative virtual reference service, the librarian faced strategic issues. According to their study, the advantages of CVRS are shared staff responsibilities, professional and community development, an extension of service hours, and relieving the risks of new service. The barriers to this service were that answering local questions might be new for others, technology and software problems, and cultural differences might have issues in answering queries. Now many libraries come for collaboration because of budget issues and the advantage of ICT. The authors suggested recommendations for improving collaborative digital reference services. Jin et al. [38] worked on a "Study on the collaboration mechanism of the virtual reference service". According to the authors, sharing information among the same-intention libraries was fruitful for giving digital reference services. The paper examined the proposed model for CVRS and measured its fruitfulness. The paper has a limitation that a large number of libraries could not consider while doing it. The paper suggested three basic collaborative proposed models for achieving successful CVRS. Kasowitz et al. [39] conducted a study on "Quality standards of digital reference consortia". They discussed the working set of standards for internet-based human media reference services and collaborative digital reference services. This study made a standard for reference service, collaborative reference service, and a standard also made for the user's perspective. They suggested a revised standard for finding it lacking. They also mentioned a service development and management approach in which they gave a full standard for how to make a CVRS. They also discussed a way to apply this service in libraries.

3.5. Studies on DRS in abroad

Uutoni [40] studied "Providing digital reference services: A Namibian case study". The author of this study on the Namibia University of Science & Technology (NUST) and University of Namibia (UNAM) libraries focused on two aspects: resources and elements of digital library models. The study found that two university libraries provided general DRS, but they did not follow the IFLA and RUSA guidelines for providing DRS. They found barriers and suggested how to improve those barriers. A study conducted by Chowdhury and Karmakar [41] on "Digital reference services: Special reference with national libraries of US, UK, Japan, Argentina, Australia, and Nigeria". The main objective of this study was to find out the DRS in national libraries of other countries. They found that the national libraries provided DRS, including e-mail service, online catalog service, library websites, etc. They also found that national libraries of different countries provided online reference services. A study conducted by Osareh et al. [42] on "A digital reference desk for the national library of Iran: A prototype based on content analysis of the digital reference desks of the world's national libraries". The study was done because of a prototype-based digital reference service for the national library of Iran. This paper examined 33 national library DRS that offer their services in the English language. The finding of the study was that the authors found 21 features for giving the best DRS in Iran. They made a model for giving better DRS in the national library of Iran. Chowdhury and Margariti [43] studied "Digital reference services: A snapshot of the current practices in Scottish libraries". They discussed the DRS provided by the three academic libraries in Scotland, namely Glasgow University Library, University of Strathclyde Library, and Glasgow Caledonian University Library, and the two most renowned libraries, namely Mitchell Library in Glasgow and the National Library of Scotland in Edinburgh. They found that DRS provided effectively, but there is no standard domain for these services. But with the advanced technology, the librarians take the initiative for providing better DRS.

3.6. Studies on DRS in public libraries

Bhattacharya [44] studied on "Digital reference services: scenario of public libraries in India and Abroad". The paper discussed DRS and different tools for providing DRS. It showed the need, advantages, and disadvantages of how to evaluate DRS. The paper recommended some programs for providing DRS in public libraries in India. It showed a comparison between DRS in India and abroad. Biswas [45] discussed "Digital reference service through social media: a step towards rejuvenation of public libraries". This article showed the importance of social media for providing DRS and gave a model for providing DRS. This paper also showed the responsibilities of library professionals and mentioned the barriers they face to providing DRS. Rai et al. [46] stated, "Digital reference service for senior citizen patrons in public libraries of Siliguri sub-division, West Bengal: Prospects and possibilities". The paper provides some recommendations for public libraries to organize DRS for senior citizens. Ghosh [47] on "Need of digital reference services for public libraries in digital India environment: A case study". The paper made a comparative study between the librarians and users. According to librarians and users, DRS is needed in public

libraries. The paper showed what types of services were provided by the libraries and which form was preferable to the users for getting DRS. The limitation of this paper is that it studied only 4 libraries and 104 users. Das and Mitra [48] stated in the article "The importance of digital reference services towards career counseling through public library". The paper discussed a different role of public libraries. Jana and Chakraborty [49] focused on the "Role of public library in making new dimension in digital information and reference service". The authors discussed the role of public libraries in giving DRS a new dimension, i.e., library collaboration. Banerjee and Banerjee [50] worked on "Status of reference service in public libraries of West Bengal in the 21st century". The study discussed the scenario of DRS provided by the public libraries of West Bengal. The paper discussed the collection, staff, and infrastructure of 4 town libraries in Hoogly district. The paper also mentioned the problems and opportunities that faced public libraries for providing DRS. Chintury and Paul [51] studied "Digital reference service in public library system of Sikkim: Challenges and opportunities". The study discussed the problems faced by the public libraries of Sikkim. They identified the problems that they faced in giving DRS. The study also proposed a model for DRS and also gave some suggestions.

3.7. Studies on DRS in academic libraries

Alexander and Wakimoto [52] discussed "Explorations of reference models in a public university system". The purpose of this study was to find out the reference and public service models used at California State University. The study found that the majority of students still use traditional reference services, and the reference librarian has a desk for providing service. The respondents agreed that they benefited from providing model reference services. This study works on only traditional reference services. Mondal and Bhattacharya [53] studied on "Availability of digital reference service: a comparative study among global and Indian academic libraries". The main purpose of this paper was to identify the DRS provided by the academic libraries and make a comparative analysis between India and foreign countries. Indian academic libraries facilitate very poor reference services than other countries. The study also found that in India and abroad, most of the libraries provided DRS only during office hours. The paper provided some suggestions that are helpful to improve their service in academic libraries.

Bandyopadhyay and Boyd-Byrnes [54] stated, "Is the need for mediated reference service in academic libraries fading away in the digital environment?" The paper showed that present days' academic libraries have undergone many changes due to the high demand for digital resources, and users of these libraries prefer Google, Google Scholar, and other search engines to meet their expectations. As a result, the academic libraries' reference services are decreasing day by day. This paper tries to show the importance of human-mediated reference services for effective and efficient service. The paper also shows the skills and knowledge of library professionals in the digital environment. This paper showed the merits and demerits of current trends in reference services in academic libraries. Dollah and Singh [55] highlighted "Digital reference services in academic libraries". The paper focused on emerging formats and models for digital reference services. The paper discussed the origin of DRS. The

modes of DRS like e-mail, chat, collaborative digital reference service, chat robot, and video conferencing were discussed here. The paper also highlighted DRS in academic libraries in Malaysia. The paper only discussed some Malaysian university websites but did not explain any of the types of resources provided by them. Emmanuel Baro et al. [56] focused on "Reference inquiries received through different channels: the challenges reference librarians face in university libraries in Nigeria". The article demonstrated different channels used in reference services in different university libraries. The most used channel is face-to-face interaction between reference librarians and users. The other channels are the Facebook page, short message service (SMS), instant messaging (IM), and e-mail. The main challenge faced while providing virtual reference service was the policy statement. Other challenges were a lack of knowledge of reference librarians, severe electricity failures, slow internet, and technological problems. This paper only showed the problems of providing virtual reference services. This paper did not provide a solution to those problems.

Malik and Mahmood [57] stated, "Infrastructure needed for digital reference service (DRS) in university libraries: an exploratory survey in Punjab, Pakistan". The main purpose of this paper was to know the infrastructure needed for ICT to convert traditional reference services into digital ones in university libraries in Punjab, Pakistan. The study was done on 40 university libraries and found that some libraries adopted the electronic format of resources for providing DRS, but most of the universities provided face-to-face reference services. Diamond and Pease [58] conducted a study on "Digital reference: A case study of question types in an academic library". They analyzed two years of reference questions that came from the users. They categorized those questions from simple to complex. Librarians can do their responsibilities easily and analyze them so that the reference service in a digital library environment. Chowdhury et al. [59] conducted a study on "Digital reference service in academic libraries in Bangladesh: A practical experience". The study discussed elaborately about different tools of DRS, their necessity, advantages, and limitations. The paper discussed the role librarians have to play in providing DRS. This study gave some recommendations to library professionals for providing good DRS in academic libraries.

The above review revealed that there were many studies conducted on digital reference services. However, studies in Bangladesh showed that there was a lack of research on DRS in Bangladesh. No person in our country has worked on this title before. Thus, we want to know the present status of DRS in university libraries, the challenges faced by the university libraries, and to develop a plan for providing DRS in university libraries.

4. Methodology

The core objective of this study is to explore the digital reference service in public university libraries in Rajshahi, Rangpur, and Khulna divisions for proposing policy. From this viewpoint, this study is a policy research; on the other hand, this study evaluates the existing DRS in public university libraries. So it is an evaluative study also.

4.1. Population and sample

All the public university libraries in Rajshahi, Rangpur, and Khulna division and their library users are regarded as the population for this study. There are 9 public university libraries in the mentioned three divisions at present. Of the 9 public university libraries, 6 are treated as samples. The university libraries that provide DRS are selected as samples in this study. The sample university libraries are:

Rajshahi University Central Library.

Central Library, RUET.

Central Library, Khulna University.

Central Library, KUET.

Central Library, JUST.

Central Library, Hajee Mohammad Danesh Science & Technology University.

Besides these, 120 library users are selected as samples (20 from each public university library) for this study. Sample library users are chosen purposefully. The researcher follows some criteria to select library users. They are:

Students who use the library at least 3 days a week.

Students who fill up the questionnaire willingly.

Students who use the library or are present in the library at the time while the researcher visits the library.

4.2. Sources of data

Primary sources: The primary sources of this study are high officers of the selected libraries and library users.

Secondary Sources: Books, journals, articles, newspapers, etc. are used as secondary sources in this study.

4.3. Data collection tools

The core data for this study was collected through structured questionnaires. Two sets of structured questionnaires were prepared before collecting data. One set for library professionals and another set for library users. Both open and closed-ended questions are included to prepare the questionnaires. Besides questionnaires, the interview method has also been used to collect data. While collecting data from library users, group discussion was conducted by the researcher in the same cases. In such a situation, researchers discussed the study objectives first, then distributed the questionnaires to the university library users. After filling up the questionnaire appropriately, users submit the questionnaire to the researcher.

4.4. Data analysis and data presentation

All the collected data has been analyzed with the help of a computer. Modern statistical methods are also used to analyze data. Finally, collected data has been shown in tabular forms like tables and figures.

5. Results analysis

5.1. Library sections exercise by library users

Table 1 represents the library sections that are exercised by university library users. Under the survey, it was found that 84.2% of users read room facilities. The computer section is a vital section of the library used by only 2.5% of users. Text textbook section is used by 82.5% of users. The study found that research, which is the most important section of the library, is exercised by only 40% of users. Reference section used by 39.2% of users. 20.8% of library users use the career guidance section. Liberation War Corner, which is necessary for knowing about Bangladesh, is used by 3.3% of users. Bongobondhu Corner is one of the most important sections used by 6.7% of users. Audio-visual and newspaper archives sections are used by only 1.7% of users.

Table 1. Library sections are exercised by library users.

Sections	No of responses
Reading room and circulation	101 (84.2)
Textbook	99 (82.5)
Research	48 (40.0)
Reference	47 (39.2)
Rare book section	30 (25.0)
Career guidance	25 (20.8)
Reprography	20 (16.7)
Bongobondhu corner	8 (6.7)
Liberation war corner	4 (3.3)
Computer	3 (2.5)
Audio-visual section	2 (1.7)
Newspaper archives	2 (1.7)

5.2. E-resources used by library users

Table 2 demonstrates that 35.8% of respondents read e-books facilitated by the library. 29.2% of respondents read e-journals and e-articles. E-thesis paper, which is a vital element for research purposes, is used by only 24.2% of library users. E-magazine is read by 23.3% of respondents. The e-reference book, which is a necessary element in education, is used by 23.3% of respondents. 22.5% of respondents read e-newspapers through library websites. Full-text database used by 15.8% of respondents. Under the survey, it was found that e-reports were used by a few numbers of respondents, i.e., 11.7%. One of the necessary elements in the education sector, namely e-clipping, is used by 5.8% of respondents only.

Table 2. E-resources used by library users.

E-resources	No of responses
E-books	43 (35.8)
E-journals	35 (29.2)
E-articles	35 (29.2)
E-thesis	29 (24.2)
E-magazines	28 (23.3)
E-reference books	28 (23.3)
E-newspapers	27 (22.5)
Statistical database	24 (20)
Full-text database	19 (15.8)
E-patents	18 (15)
E-reports	14 (11.7)
Image collection	11 (9.2)
Multimedia products	10 (8.3)
E-standard	10 (8.3)
Indexing and abstracting database	9 (7.5)
E-clipping	**7** (5.8)

5.3. Services for getting E-resources

Table 3 represents that for getting e-resources, 17.5% of respondents always prefer current awareness service (CAS), and 7.5% of respondents often take CAS. It finds that the majority of students, that is, 72.5%, never take CAS service. Under the survey, it is observed that the selective dissemination of information (SDI) service is always taken by 5.8% of respondents, and 11.7% of respondents often take this service. A large number of respondents—75.8%—never receive SDI service. Only 5% of respondents always receive e-document delivery service, 2.5% of respondents often take this service, 11.7% of respondents sometimes receive this service, and the majority number of respondents, i.e., 77.5%, never take this service. It was also found from the study that the online public access catalog (OPAC) is the most useful service for finding accurate materials used by 15% of respondents always and 5.8% often. A multiplicity number of respondents, i.e., 70%, never use OPAC service. A small number of respondents receive literature search services, which is 6.7% always and 13.3% often. DRS always takes 6.7% of respondents and often by 4.2% of respondents. The survey found that resource sharing through websites and bibliographic services was received by a small number of respondents. Institutional repository, which is a vital service received by 9.2% of respondents always and 8.3% often. 70.8% of respondents never take this service. Frequently asked questions service is always received by only 10% of respondents, 4.2% often. 74.2% of respondents never take this service.

Table 3. Services for getting e-resources.

Services	Frequency scale				
	1	**2**	**3**	**4**	**5**
Online public access catalog	18 (15)	7 (5.8)	5 (4.2)	6 (5)	84 (70)
Frequently asked question	12 (10)	5 (4.2)	7 (5.8)	7 (5.8)	89 (74.2)
Institutional repository	11 (9.2)	10 (8.3)	10 (8.3)	4 (3.3)	85 (70.8)
Literature search service	8 (6.7)	16 (13.3)	8 (6.7)	6 (5)	82 (68.3)
E-reference service	8 (6.7)	5 (4.2)	16 (13.3)	2 (1.7)	89 (74.2)
E-document delivery service	6 (5)	3 (2.5)	14 (11.7)	4 (3.3)	93 (77.5)
Current awareness service	21 (17.5)	9 (7.5)	2 (1.7)	1 (0.8)	87 (72.5)
Resources sharing through the website	2 (1.7)	10 (8.3)	13 (10.8)	3 (2.5)	92 (76.7)
Selective dissemination of information	7 (5.8)	14 (11.7)	6 (5)	2 (1.7)	91 (75.8)
Bibliographic service	1 (0.8)	3 (2.5)	5 (4.2)	8 (6.7)	103 (85.5)

5.4. Status of reference service

Figure 1 shows that the respondents were asked what the condition of the library reference service is. According to their responses, 36.7% of respondents mentioned that the library provides a digital reference service, and 63.3% of respondents said that the library provides a traditional reference service.

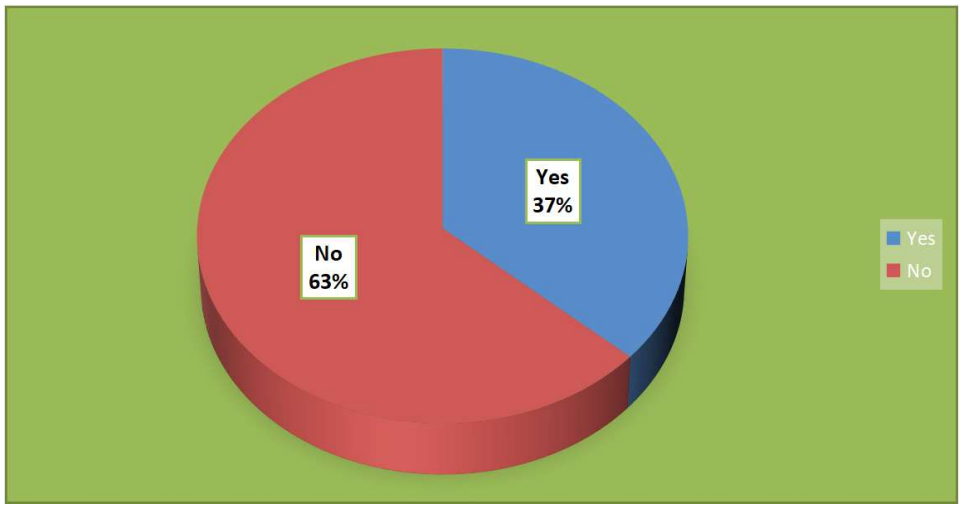

Figure 1. Status of reference service according to users.

5.5. Reasons for taking digital reference service

Table 4 reveals the reasons for taking DRS. Under the survey, it is found that the respondents agree with the statement that they take DRS for need of information (mean = 3.72). DRS is provided for solving queries in real-time, but the respondents give no opinion about it (mean = 3.23). Through DRS, the clarification can be sought online, which means that to get library service, the users do not need to go to the library physically, but the respondents do not give any opinion about the statement (mean = 2.88). DRS helps locate actual needed information, although the respondents give no opinion (mean = 3.03).

Table 4. Reasons for taking digital reference service.

Reasons	Mean	SD
Need of information	3.72	0.99
User's query is solved in real-time	3.23	0.51
The speed of this service is faster than traditional	3.18	0.67
The mode of receiving and answering questions is cost-effective	3.04	0.71
Find it helpful to locate their actual needed information	3.03	0.53
No restriction on working time, you can ask query any time	2.93	0.77
This service offers any time (24/7)	2.89	0.93
Clarification can be sought online	2.88	0.72
Reference librarians can interact with multiple users simultaneously	2.87	0.74

5.6. Resources used for getting DRS

Table 5 presents that one of the essential reference materials, namely e-books, is used by 34.2% of respondents. Encyclopedia is used by 25% of respondents. The study finds that 24.2% of respondents use newspapers as reference materials. One of the vital reference materials, namely dictionaries, is used by 22.5% of respondents. 20% of respondents use handbooks and biographical databases. Thesis/dissertation which is important reference material; the study finds that only 18.3% of respondents use this material. Abstracts and government documents are used by 11.7% of respondents. Index and thesauri, which are vital reference materials used by only 7.5% of respondents. The study found that yearbooks and almanacs were used by 5.8% of respondents.

Table 5. Resources used for getting DRS.

Reference materials	No of responses
E-books	41 (34.2)
Encyclopedia	30 (25)
Newspaper	29 (24.2)
Dictionaries	27 (22.5)
Handbooks	24 (20)
Biographical database	24 (20)
Thesis/dissertation	22 (18.3)
Gazetteers	21 (17.5)
Bibliographies	16 (13.3)
Abstract	15 (12.5)
Government document	15 (12.5)
Directories	14 (11.7)
Statistical resources	14 (11.7)
Guide book	13 (10.8)
Maps	13 (10.8)
Geographical source	13 (10.8)
Atlas	10 (8.3)

Table 5. (*Continued*).

Reference materials	No of responses
Index	9 (7.5)
Thesauri	9 (7.5)
Yearbooks	7 (5.8)
Almanac	7 (5.8)

5.7. Areas of getting DRS

Table 6 clarifies that the respondents get DRS in different fields. Under the survey, it is found that in the cultural sector, 10% of respondents always take DRS and 79.2% of respondents never take DRS. 4.2% of respondents always and 7.5% of respondents often take DRS in the religion sector. 79.2% of respondents never take service in this section. The majority of the respondents, i.e., 74.2%, never take any service in the social issues sector. In education and research, 22.5% of respondents always receive DRS, and 8.3% of respondents often receive service. About 63.3%, that is a large number of respondents, never take any service in the education and research field. Only 3.3% of respondents always and 5% take DRS in different occupations. 82.5% of respondents never take any service in this sector. 5.8% of respondents always and 7.8% of respondents often take DRS on medical, and 78.3% of respondents never receive DRS on medical. 10% of respondents always and 5% of respondents often receive DRS on job-oriented. 75% of respondents never take any service in the job sector. In the subjective field, 17.5% of respondents take DRS always and 4.2% often. 70.8% of respondents never receive DRS in the subjective field. 19.2% of respondents always take DRS in current news. 66.7% of respondents never take any service in the current news sector. Higher education is an important part of any student. However, in the survey, it was found that only 20% of respondents always take service in higher education. But the majority of the students, i.e., 67.5%, never receive any service in the higher education sector.

Table 6. Areas of getting DRS.

Areas	Frequency scale				
	1	2	3	4	5
Education and research	27 (22.5)	10 (8.3)	4 (3.3)	3 (2.5)	76 (63.3)
Higher education	24 (20)	5 (4.2)	6 (5)	4 (3.3)	81 (67.5)
Current news	23 (19.2)	2 (1.7)	14 (11.7)	1 (0.8)	80 (66.7)
Subjective	21 (17.5)	5 (4.2)	7 (5.8)	2 (1.7)	85 (70.8)
Cultural sector	12 (10)	3 (2.5)	7 (5.8)	3 (2.5)	95 (79.2)
Job oriented	12 (10)	6 (5)	8 (6.7)	4 (3.3)	90 (75)
Social issues	9 (7.5)	5 (4.2)	10 (8.3)	7 (5.8)	89 (74.2)
Medical	7 (5.8)	7 (5.8)	7 (5.8)	5 (4.2)	94 (78.3)
Religion	5 (4.2)	9 (7.5)	5 (4.2)	6 (5)	95 (79.2)
Different occupations	4 (3.3)	6 (5)	10 (8.3)	1 (0.8)	99 (82.5)

5.8. Prefer methods for getting DRS

Table 7 indicates that 16.7% of respondents always use e-mail methods for receiving answers from library professionals, and the majority of the respondents, i.e., 74.2%, never take this method. 14.2% of respondents always take the web form for getting DRS, and 12.5% of respondents often take this service. 70.8% of respondents never receive this method for getting DRS. In the survey, it was found that 64.2% of respondents never received any service using Facebook. The majority of the respondents, i.e., 83.3%, never take the FAQ service. Ask-a-librarian service is used by 5% of respondents always and 5.8% of respondents often. The study finds that only 0.8% of respondents always take service through chat reference, and 3.3% of respondents often receive this service. 83.3% of respondents never receive this service. Video conferencing is a vital method to interact with users, but 83.3% of respondents never take this service. 86.7% of respondents never take e-reference robot service. 7.5% of respondents always receive collaborative networks for reference services. 75% of respondents never take this service.

Table 7. Prefer methods for getting DRS.

Methods for getting DRS	**Frequency scale**				
	1	**2**	**3**	**4**	**5**
E-mail	20 (16.7)	5 (4.2)	6 (5)	-	89 (74.2)
Webform	17 (14.2)	15 (12.5)	3 (2.5)	-	45 (70.8)
Collaborative networks for reference	9 (7.5)	4 (3.3)	9 (7.5)	8 (6.7)	90 (75)
Facebook (library fan page)	8 (6.7)	7 (5.8)	26 (21.7)	2 (1.7)	77 (64.2)
Ask-A-Librarian	6 (5)	7 (5.8)	10 (8.3)	2 (1.7)	95 (79.2)
Chat reference using simple technologies	1 (0.8)	4 (3.3)	11 (9.2)	4 (3.3)	100 (83.3)
Video conferencing	1 (0.8)	2 (1.7)	10 (8.3)	7 (5.8)	100 (83.3)
FAQs	-	8 (6.7)	6 (5)	6 (5)	100 (83.3)
E-reference robot	-	1 (0.8)	9 (7.5)	6 (5)	104 (86.7)

5.9. Frequency of getting DRS

Table 8 brings out the frequency of getting DRS. Under the survey, it was found that 15% of respondents asked for DRS from 8.00 a.m. to 11.00 p.m. 17.5% of respondents exercised DRS from 11.00–2.00 p.m. The majority of respondents exercised DRS from 2.00–5.00 p.m. Only 7.5% of respondents use DRS from 5.00–8.00 p.m.

Table 8. Frequency of getting DRS.

Hours	No of responses
8.00–11.00 a.m.	18 (15)
11.00–2.00 p.m.	21 (17.5)
2.00–5.00 p.m.	31 (25.8)
5.00–8.00 p.m.	9 (7.5)

5.10. Areas of getting DRS

Table 9 shows that 34.2% of respondents asked for reference service from the library physically. 22.5% of respondents request queries from the department. 13.3% of respondents ask for queries from academic areas such as halls or residential areas. 12.5% of respondents receive the service from home. Only 5.8% of respondents ask for queries from anywhere through the library website.

Table 9. Areas of getting DRS.

Areas	No of responses
Library	41 (34.2)
Department	27 (22.5)
Academic area	16 (13.3)
Home	15 (12.5)
Anywhere	7 (5.8)

5.11. Techniques to know about DRS

Table 10 presents that 25% of respondents always know about DRS via library websites. 5.8% of respondents often know about DRS through the library website. 65% of respondents were never aware of the techniques. 10.8% of respondents often know about DRS through library bulletins and 80% of respondents are never aware of this technique. Only 3.3% of respondents always attend library orientation programs, and 5% often know about DRS through this technique. 79.2% of respondents never attend an orientation program. 4.2% of respondents often know about DRS through library brochures, and 9.2% of respondents sometimes know about DRS through brochures. 80.8% of respondents never know about DRS through library brochures. 5% of respondents always know about DRS via library seminars, and 5.8% often follow library seminars to know about DRS. 77.5% of respondents were never aware of DRS through library seminars.

Table 10. Techniques to know about DRS.

Techniques	Frequency scale				
	1	2	3	4	5
Library website	30 (25)	7 (5.8)	5 (4.2)	-	78 (65)
Library seminar	6 (5)	7 (5.8)	7 (5.8)	7 (5.8)	93 (77.5)
Library orientation	4 (3.3)	6 (5)	14 (11.7)	1 (0.8)	95 (79.2)
Library bulletin	2 (1.7)	13 (10.8)	8 (6.7)	1 (0.8)	96 (80)
Library brochure	-	5 (4.2)	11 (9.2)	7 (5.8)	97 (80.8)

5.12. Queries types in DRS

Table 11 indicates that 14.2% of respondents always ask for factual and brief reference queries. Most of the respondents, i.e., 76.7%, never ask for this type of query. 16.7% of respondents always ask for the use of online databases, and 14.2% of respondents often want services for the use of online databases. Under the survey, it was found that 65.8% of respondents never demanded this type of query. The queries, namely locating materials, were demanded by 3.3% of respondents always and 4.2% of respondents often. 80% of respondents never ask for this query. Guidelines on the use of library information tools were asked by only 11.7% of respondents. The majority of the respondents, i.e., 70.8%, never receive this type of query. How to get the document in print or non-print form, which means document delivery query asked by 11.7% of respondents 75% of respondents never demand a document delivery query. Only 16.7% of respondents always asked how to search literature. Referrals, library direction, and bibliographic verification queries were asked by a small number of respondents. To get authentic documents, identifying and gathering materials is an important query, but the study found that 3.3% of respondents ask for this type of query, and 82.5% of respondents never ask for how to identify and gather materials.

Table 11. Queries types in DRS.

Queries types	**Frequency scale**				
	1	**2**	**3**	**4**	**5**
Use of online database	20 (16.7)	17 (14.2)	3 (2.5)	1 (0.8)	79 (65.8)
Literature search	20 (16.7)	2 (1.7)	9 (7.5)	4 (3.3)	85 (70.8)
Factual and brief reference queries	17 (14.2)	5 (4.2)	5 (4.2)	1 (0.8)	92 (76.7)
Use library information tools	14 (11.7)	7 (5.8)	11 (9.2)	3 (2.5)	85 (70.8)
Document delivery	14 (11.7)	5 (4.2)	10 (8.3)	1 (0.8)	90 (75)
Referrals	14 (11.7)	5 (4.2)	7 (5.8)	2 (1.7)	92 (76.7)
Locating materials	4 (3.3)	5 (4.2)	15 (12.5)	-	96 (80)
Identifying and gathering materials	4 (3.3)	4 (3.3)	8 (6.7)	5 (4.2)	99 (82.5)
Library directions	3 (2.5)	4 (3.3)	14 (11.7)	5 (4.2)	94 (78.3)
Bibliographic verification	3 (2.5)	5 (4.2)	7 (5.8)	5 (4.2)	100 (83.3)

5.13. Method for receiving answers from library

Table 12 states that the users prefer different methods for getting DRS. Under the survey, it was found that only 15% of respondents prefer the e-mail method for receiving DRS. The majority of the respondents, i.e., 77.5%, never used this method. In the study, it was found that 7.5% of respondents use phone calls to receive DRS. A phone call is a cost-effective method, but 80% of respondents never use this method.

15% of respondents always get the service by physical appearance, and 8.3% of respondents often receive this service. 81.7% of respondents never write the query in the library website drop box. Facebook page is an easy medium for getting DRS, but 84.2% of respondents never use the Facebook page for receiving queries.

Table 12. Method for receiving the answer.

Method	Frequency scale				
	1	**2**	**3**	**4**	**5**
E-mail	18 (15)	4 (3.3)	3 (2.5)	2 (1.7)	93 (77.5)
Physical appearance	18 (15)	10 (8.3)	14 (11.7)	1 (0.8)	77 (64.2)
Phone call	9 (7.5)	7 (5.8)	4 (3.3)	4 (3.3)	96 (80)
Write the query on the library's Facebook page	2 (1.7)	2 (1.7)	13 (10.8)	2 (1.7)	101 (84.2)
Write the query in the library website drop box	1 (0.8)	5 (4.2)	10 (8.3)	6 (5)	98 (81.7)

5.14. Answering the queries that the user asked

Table 13 explains that reference librarians always answer their queries, which is opined by 10.8% of respondents. 8.3% of respondents mention that reference librarians often answer queries. 75.8% of respondents mention that reference librarians never answer their queries. 20% of respondents say that librarians always answer the queries. 13.3% of respondents mention that librarians often answer their queries. According to 64.2% of respondents' librarians never answered their queries. 5% of respondents said that information specialists always answer queries, but 79.2% of respondents said that information specialists never answer queries. According to 13.3% of respondents, library staff answered the queries always. However, 69.2% of respondents mentioned that library staff never responded to the queries.

Table 13. Answering the queries that the user asked.

Answering the queries	Frequency scale				
	1	**2**	**3**	**4**	**5**
Librarian	24 (20)	16 (13.3)	3 (2.5)	-	77 (64.2)
Library staff	16 (13.3)	7 (5.8)	7 (5.8)	7 (5.8)	83 (69.2)
Reference librarian	13 (10.8)	10 (8.3)	6 (5)	-	91 (75.8)
Information specialists	6 (5)	6 (5)	10 (8.3)	3 (2.5)	95 (79.2)

5.15. Problems faced in getting DRS

What types of problems faced by users in getting DRS have been ranked on a 5-point Likert scale, viz., strongly agree, agree, no opinion, disagree, and strongly disagree, gradually from 5 to 1. The data analysis of the result is shown in **Table 14**.

Table 14 demonstrates the different types of problems the users faced for receiving DRS. Based on the survey, the respondents gave no comments on what types of problems they faced while taking DRS. But the technological problem, several

electricity fails, and the low speed of the internet are several problems faced by the users.

Table 14. Problems faced in DRS.

Problems	Mean	SD
Lack of awareness of wide range of source	3.40	0.77
Typing speed and errors occurring during typing text	3.37	0.82
Lack of trained staff	3.31	0.79
Low speed of internet	3.24	0.78
Difficulty in communicating proper massage between you and the reference librarian	3.22	0.61
Need to type the complete question and reference librarian need to answer in typed format	3.17	0.42
Technological problem	3.16	0.65
Several electricity failed	3.13	0.58
Reference librarian while busy answering several questions at a time, may not attend urgently needed questions	3.12	0.45
Technophobia of the staff	3.10	0.47
Stressful for you to wait for the answer every time	3.09	0.66
Lack of willingness of the staffs for providing E-reference service	3.08	0.51
Insufficiency of expert professional	3.07	0.57
Speed of receiving and answering questions depends on the e-mail traffic	3.05	0.73
Lack of well-defined E-resource collection development policy	3.02	0.52

6. General discussion

The majority of the respondents, that is, 84.2%, use the library general section, which means the reading room and circulation section. Most of the respondents, i.e., 82.5%, use textbook sections. One of the vital sections of the library, namely the computer section, is used by only 2.5% of respondents. Another vital section, namely research, was used by 40% of respondents. Liberation War Corner, which is an important section to know about Bangladesh, is used by 3.3% of respondents. The newspaper archive section is used by 1.7% of respondents.

The core e-resources, i.e., e-books and e-journals, are used by 35.8% and 29.2% of respondents, respectively. One of the emerging e-resources, namely the e-thesis paper, was used by 24.2% of respondents. Few numbers of respondents, i.e., 23.3%, use e-reference books. A small number of respondents, i.e., 15.8%, use full-text databases. Another vital e-resource indexing and abstracting database is used by 7.5% of respondents. One of the necessary elements in the education sector, namely e-clipping, is used by 5.8% of respondents.

A few numbers of respondents, i.e., 17.5%, take CAS service to get e-resources. SDI service is received by a small number of respondents, i.e., 5.8% always and 11.7% often. The researcher collected data randomly from the library only when the researcher went for the data collection. Most of the respondents were undergraduate students who use the library frequently. In the use of CAS and SDI services, SDI is mainly used by the researcher. That's the reason CAS is mainly used rather than SDI. Through OPAC, users can easily access their desired document, but only 15% of

respondents always use OPAC. Only 6.7% of respondents always receive DRS, and 4.2% of respondents often take DRS. One of the vital services, namely the bibliographic service, is used by 2.5% of respondents often. Other essential services, i.e., the institutional repository, are used by 9.2% of respondents always and 8.3% of respondents often.

Among 120 respondents, 63.3% of respondents stated that the status of reference service is traditional, and 36.7% of respondents stated that the condition of reference service is digital.

Most of the respondents create requests for digital references when they need any type of information. DRS also helps to solve queries in real-time, and clarification can be sought online quickly, but the respondents do not provide any comments regarding these. AI is one of the newest DT trends that the university library can take advantage of to offer alternative educational services to library users. AI can make intelligent decisions for obtaining and sharing data for learning and research purposes. However, existing literature confirms that university libraries are not taking advantage of AI to offer innovative alternative services, as this is missing from their strategic plan [60].

A small number of respondents, i.e., 34.2%, use e-books as reference materials. An important reference material, namely an encyclopedia, is used by only 25% of respondents. The thesis paper is an important reference material, although it is used by 18.3% of respondents. Abstract is used by 11.7% of respondents. Index and thesaurus are necessary reference materials, but only 7.5% of respondents utilized these materials.

All the surveyed libraries offer DRS in different areas. But a large number of respondents take DRS in the education and research fields; 22.5% of respondents take DRS always, and 8.3% of respondents take DRS often. 20% of respondents always receive DRS in higher education. 17.5% of respondents get DRS in the interested subject field. Information on current news is facilitated by surveyed libraries, but 19.2% of respondents always take DRS on current news. A small number of respondents receive services in the cultural sector, religion, social issues, and job-oriented. Mobile applications are gaining a great deal of interest among researchers due to their proliferation and pervasiveness, especially in the context of digital libraries at educational institutes. However, their low acceptance and usage are observed; hence, in-depth investigations are required in order to understand the factors behind low acceptance and intention to use mobile library applications (MLA), Rafique et al. [61].

E-mail is one of the most popular methods because it is the easiest and cheapest, but only 16.7% of respondents prefer it for receiving information from libraries. A small number of respondents 14.2% of respondents always get DRS through a web form, and 12.5% of respondents often prefer this method. Facebook is a popular medium to get information, but only 6.7% of respondents and 5.8% of respondents often receive queries through Facebook. Video conferencing is the best way to interact with people. Through video conferencing, the users can clarify what they actually need, but 1.7% of respondents adopt this method for getting answers. The surveyed libraries have collaborative networks with other libraries, but only 7.5% of respondents and 3.3% of respondents often receive queries through collaborative networks. The amount of disruptive innovation used in library operations is little, and

the obstacles to its acceptance are the high expenses associated with internet access, system maintenance, and upgrades, as well as the high cost of educating library staff, Adekoya and Adedimeji [62].

The respondents of surveyed libraries do not pay any amount of money for digital reference services.

The respondents mention that they ask for digital reference service from 8.00 a.m. to 8.00 p.m.

About 34.2% of respondents can access the library materials from the library. 22.5% of respondents present queries from department areas. Only 12.5% of respondents search their queries from home. A small number of respondents, i.e., 5.8%, access library materials from anywhere. Understand dual digitization by focusing on how it changes the student-teacher relationship, how it interconnects the digital and the physical at the university, and how datafication changes the content, Øvrelid et al. [63].

Only 25% of respondents know about DRS from the library website. A small number of respondents, i.e., 10.8%, know about DRS through the library bulletin. Only 3.3% of respondents attend library orientation programs to know about library services. A small number of respondents, i.e., 5%, always attend library seminars to know about new services.

About 14.2% of respondents always request factual and brief queries. On the other hand, about 30.9% of respondents ask for the use of the online database.

A few numbers of respondents, i.e., 15%, always prefer the e-mail method to get the service from the library. A phone call, which is a cheap and easy method to communicate with library professionals, is used by 7.5% of respondents. Only 23.3% of respondents get the service presented in the library physically. A smaller number of respondents write queries in the library website drop box for receiving DRS.

About 33.3% of respondents state that they get the service from the librarian. Only 10% of respondents mention that information specialists help them in getting information, while 13.3% of respondents remark that library staff answers their queries.

7. Conclusion

University libraries are very much alive in higher education and other research environments. According to the Librarian's Glossary, "a university library is a library or group of libraries established, maintained, and administered by a university to meet the needs of its students and members of the academic staff". The students of public universities are always information seekers and try to keep themselves updated. In this situation, they depend on Google, Google Scholar, and other search engines. But most of the students are not able to find what they need online, and sometimes they find false information. Without proper knowledge on how to verify the authenticity, they use the false information in their academic assignments or for research purposes. A digital reference service plays the main role in communicating between users. DRS helps professionals maintain and disseminate the actual information that fulfills the demands of users. This study tries to find out the present condition of the digital reference service in the selected public university libraries. The selected libraries

provide DRS to their users, but not all the libraries are fully digitalized. They only provided partial digital reference services. The professionals of the investigated libraries try their best to fulfill the requirements of users, but some problems they faced, like a lack of trained staff, a scarcity of budget, a lack of modern technologies, etc. Besides these problems, libraries are served through databases, e-books, online newspapers, statistical databases, institutional repositories, and other reference materials, but it is not enough to fulfill the users demand because there is a communication gap between library professionals and users.

The study finds that the libraries facilitate DRS, but the students do not get the service. The reason behind this is that library professionals do not properly inform users about new services. Library professionals should make users aware through different techniques and the use of social media like Facebook and Twitter to attract users to the service. A way to arrange digital reference service library collaboration. If the public university libraries come forward for collaborative library service, the users get the best benefit of the service. Integrated library service helps professionals overcome their problems and become more efficient.

It is high time for every public university library to make resources and services digital. University libraries should set up a proper policy and guidelines for DRS; with these, they can meet the users' information thirst. At last, it is said that DRS fulfills the library motto, i.e., "right information, to the right users at the right time". DRS is compulsory in every public university library in Bangladesh.

8. Recommendations

8.1. Specific policies and guidelines

University libraries should formulate proper policies and guidelines for DRS to set a standard. The policies should clarify the types of questions to be answered, service time, who maintains the digital reference section, what types of technologies are used, and maintain the copyright issues. The university libraries should strictly follow the IFLA Digital Reference Guidelines, 2008, and RUSA Guidelines for Implementing and Maintaining Virtual Reference Services, 2017, which provide a proper way for implementing DRS in university libraries.

8.2. Make a digital reference section

The university libraries need to build a separate digital reference section. If the library builds a different section for digital reference service and recruits expert professionals who have enough knowledge on technologies and online databases, it can serve the users better. The highest level of users' satisfaction can be achieved in this way.

8.3. Allocate sufficient funds

University libraries need to allocate a large amount of budget for maintaining digital reference services. The digital reference section needs additional staff, and this extra budget is needed to pay the staff. Maintaining the technologies and software, reference materials, and training the staff with more funds is compulsory. This would

help the libraries to provide long-term service and run the reference section successfully.

8.4. Adequate and expert staff

To run the digital reference service, university libraries need a good number of expert professionals who have enough knowledge on digital materials and can deal with modern technologies. The university library should adopt appropriate techniques for staffing the professionals so they can provide the most effective and efficient service.

8.5. Staff training

In order to make the library professionals trained, the library authority should arrange an in-house training program on DRS. The program should be conducted on things like database searching, interviewing skills, knowledge of digital reference sources, multi-tasking ability, and knowledge of software related to DRS. The professionals should take training on service behavior parameters and policies of DRS so they can operate with users according to a set standard. The training program should be an ongoing process so that library professionals can keep them up-to-date.

8.6. Motivating the staffs

The library staff faces a psychological problem that if the library materials are available online and the service is technology-based, they could lose their job. But in digital reference service, manpower is as much as necessary insofar as technologies are necessary. The library authority has to ensure that it is not true. Library professionals act as a human mediator between online resources and the requirements of users. The library authority can arrange a seminar where they can motivate the users, give a clear concept of DRS, and encourage their willpower so that the staff can be involved in DRS willingly.

8.7. Upgrading and maintenance of technologies

The features of technologies change day by day, and new versions are also available over a period of time. The software also needs to be updated. In this regard, library professionals need to maintain updating the technologies after a fixed duration of time. With updated technologies, libraries can fulfill the users' requirements quickly and friendly. Libraries should recruit IT professionals for maintaining the hardware and software. IT professionals can troubleshoot the technologies when any types of problems arise.

8.8. Marketing of digital reference service

To make users aware of DRS, a proper marketing strategy should be made and followed by the library authority. Marketing strategy can be done on a continuous basis. The library website is an effective medium where library authorities can design service icons to make them attractive. A memorable name and logo can be used for promoting it, and some advantages of DRS would include encouraging users to use the service. At present, Facebook and Twitter are big platforms for marketing any type

of service, and the majority of the university students' have an account on social media. Thus, marketing through social media can be an effective method to make users aware and get their attention on DRS.

8.9. Users' education program

Library authorities need to arrange a well-organized user education program to enable them to utilize the service effectively. The users' education program should be arranged on a regular basis, so any student who does not attend one program can know about the service from the next one. This program helps users learn about the ins and outs of DRS.

8.10. Enhance timing of providing DRS

The libraries should enhance timing for DRS. The library authority should appoint extra staff who can give the service after the working hours. Thus, the users can ask for synchronous DRS like IM, video conferencing, etc.

8.11. Evaluation of DRS

Regular assessment of DRS informed library authorities of the strengths and weaknesses of this service and enabled them to improve the service. The evaluation process can help the authority to know what materials they have for DRS, what types of queries they get, and the most important thing is that they can know about users' expectations and perceptions of DRS. Thus, the professionals can change their features, increase reference materials, and make good communication according to users' expectations.

8.12. Involvement of concerned authority

Figure 2 indicates that university authorities should play an active role to develop the DRS in university libraries. They should provide extra funds to run the service effectively. The authority should look after that the library needs more staff in the reference section or not; the technologies they have are enough or not; they should talk with the library professionals to know about their lack and take initiative to overcome the problems.

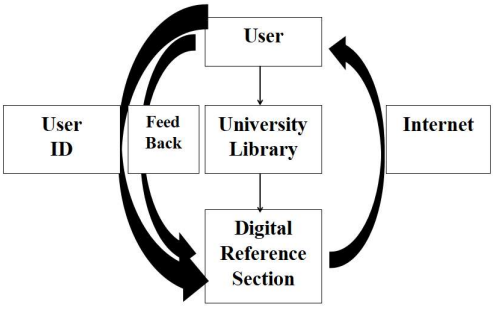

Figure 2. Propose plan.

Finally, the digital reference section communicates with the user through a mobile phone, telephone, or desktop and provides the user with necessary information through the internet. In this process, after collecting information, the user can provide his/her feedback to the university digital reference section again and again.

Figure 3 explains the public university libraries of Rajshahi, Rangpur, and Khulna divisions provide digital reference services to their university students, faculties, and researchers. But through the integrated reference system, they can provide better service. The users of all the libraries can see other libraries library resources, facilities, and services. They can use the materials when they need them. The users' can for other library resources. In this system, professionals from different libraries can exchange their views on reference services, create new plans to improve the service, share their workload, extend the time for providing synchronous service, and reduce the cost of service. An integrated reference network helps the libraries overcome their problems and provide quality service through the sharing of resources and professional opinions. This will help small libraries like CL, JUST, and HSTU. They have a few professionals who have experience with DRS, and they provide DRS in the primary stage, but when they connect with other large libraries like RUCL, CL, KUET, etc., they can provide more resources to the users and give better service. Integrated reference services help overcome financial barriers and scarcity of resources and provide various library operations and services.

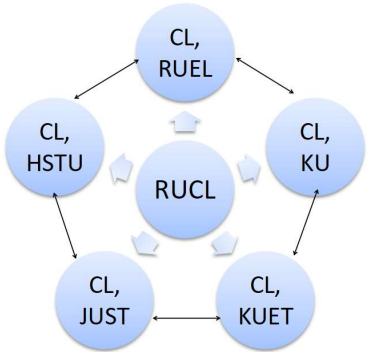

Figure 3. Integrated digital reference service.

Conflict of interest: The author declares no conflict of interest.

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