

**DIGITAL REFERENCE SERVICES IN ACADEMIC LIBRARIES: GAINS,
CHALLENGES AND ENHANCEMENT STRATEGIES**

By

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Abstract

The study examined the gains, challenges and enhancement strategies for digital reference services in academic libraries. It adopted a systematic conceptual literature review method. The study revealed that digital reference services involved library users, librarians, the interface and the information resources such as CD-based resources, Web-based resources or print resources. The study further showed that digital reference services are dependent on relevant skills which include online communication skills, online search skills, reference interview skills, etc. The study showed that the provision of digital reference services in academic libraries are hampered by a number of factors including poor funding of academic libraries, poor attitude of management of academic institutions toward the libraries, poor technological skills of librarians, lack of awareness by library users, poor internet connectivity, lack of adequate training of reference librarians on ICT skills, etc. Therefore, it is recommended in line with the need to institutionalized and implement digital reference services in academic libraries, that management of academic institutions should provide adequate funds for the academic libraries, provide constant power supply, and internet services while librarians, especially reference librarians should be trained and retrained on digital reference services' skills.

Introduction

Academic libraries are libraries attached to tertiary institutions such as universities, polytechnics, colleges of education and other allied institutions. Nwosu and Opara (2019) describe academic libraries as invaluable partners in furthering the vision, mission and objectives of the academic institutions through the provision of information materials and services for learning, teaching and research by students, faculty members and other stakeholders within and outside an academic community. They are the nerve centers of any academic institution and are regarded as indispensable instruments for intellectual development (Arua & Udoh, 2019).

A well-equipped academic library provides the curricular and educational needs of students as well as support teaching, learning and research needs of staff with up-to-date

information services such as digital reference services. They accelerate the attainment of the objectives of academic institutions by providing physical contact with library personnel, information resources and digital library services such as digital reference services. In other words, academic libraries aim at meeting the needs of academic and research community by consciously improving their services and enhancing their resources.

With the incorporation of Information and Communication Technologies (ICTs) into academic libraries, various opportunities have been created to enhance their functionality and effectiveness in services delivery. Such opportunities include the introduction of digital reference services, which enable academic libraries to maximize users' satisfaction and reach a wider number of clients as well as increase users' patronage. Through the digital reference services, academic libraries can contribute more to teaching, learning and research. In fact, with digital reference services, academic libraries can extend their services beyond the library environment, library physical space and library operating hours. This is more so, as Chow and Croxton (2014) observe that with digital reference services, academic libraries can increase their services through e-mail, chat, instant messaging, reference forms, and video conferencing. In fact, apart from changes in users' preferences and needs, the advancement in information and communication technologies (ICTs) has also brought a variety of innovative services in the academic libraries. These innovative services include digital reference services.

Digital reference services refer to highly mediated information services provided by experts usually digital reference librarians to users in a digital environment or using internet regulated systems. The primary goal of digital reference services is to ensure maximum satisfaction of library users across geographical space and time. These innovative services simply

represent a paradigm shift from conventional reference services provided by reference librarians in academic libraries. These services help in enhancing the delivery of effective information services in modern academic libraries. They aim at providing impetus for better accomplishment of the vision, mission and objectives of academic libraries by enriching the relationship between academic libraries and the users.

Relying on the above background, understanding the imperatives and prerequisites for enhanced digital reference services in academic libraries of the contemporary society form the foundation of this chapter. This is needful because much is not discussed or done about this set of emerging services in most developing countries including Nigeria, as obtainable in the developed world.

Conceptualization of Digital Reference Services

Foundationally, digital reference services are the offshoots of conventional reference services, which are parts of the primary practices of academic libraries. As commonly known, reference services are personal assistance provided by trained personnel known as reference librarians to library users who are seeking information to satisfy their needs. Reference services traditionally have been offered by a person at a designated desk within the library building, over the telephone, and through correspondence. The reference librarian primarily answers questions from patrons and/or provide readers' advisory services by handling all types of queries, from directional questions to in-depth research questions. As innovations and technologies gradually take prominent stage in the academic libraries, reference services also metamorphosed from manual practices to digitized systems.

However, Lankes and Kaswitz, as cited in Uutoni (2014) define digital reference services as internet-based question-and-answer services that connect users with individuals who possess specialized subject skills or expertise. Pinto and Manso (2012) assert that digital reference services are experts or mediators' information services to users based on the internet, which do not include other related products or services offered by library web portals such as online public access catalogues (OPAC), subject-based directories, and frequently asked questions (FAQ). Similarly, Berube (2003) refers to digital reference services as a network of expertise intermediation and resource placed at the disposal of someone seeking answers in an online environment. These innovative services are used interchangeably with such terms as Virtual Reference Services (VRS), Web-based Reference Services (WbRS), Remote Reference Services (RRS), Online Reference Services (ORS), Electronic Reference Services (EFS), Internet Reference Services (IRS), Real-Time Reference Services (RtRS), Live Reference Services (LRS), and Chat Reference Services (CRS) (ALA, 2004; Jan, 2018; Kadir, Dollah, & Singh, 2015; Kolthuri, 2014; Okoli, Ukwedeh & Idah, 2021; Oluwayibi, 2017). Digital reference services are electronic mediation between a librarian and a library user requiring an answer to a query. It primarily aims at helping a library user to determine which information resource or information service is best and how to use it such resource or service.

Abubakar (2021) conceived digital reference services as the non-physical reference services that can be provided using communication technology tools such as e-mail, Voice over Internet Protocol (VoIP), instant messaging (IM) and social media. It requires a variety of elements which include the user/client, the information professionals/librarians, the interface such as chat, email and VOIP, electronic resources like electronic or CD-based resources, and the Web and print resources (Singh, 2012). Digital reference services help in providing

individual assistance and instruction, maintenance of appropriate collection of reference resources in both print and electronic form, locating the best sources of information and marketing of reference resources, as well as serving as a public relations representative. It also helps in online searching, assisting in professional activities for development and growth, and facilitation of referral process in academic libraries. Nicol and Crook (2012) assert that digital reference services are reference services that are delivered online, which either could be synchronous or asynchronous. Synchronous digital reference services involved instant messaging and video conferencing through which users get an instant reply to their queries, while asynchronous is using email and web forms where the patron gets a reply after some time or even after some days (Dickinson & Smit, 2015).

These services are increasingly being provided and used to enhance the real time interaction between library users and the libraries (Abubakar, 2021). They have the ability to enhance the satisfaction of library users with the reference services at less energy and time. They embody all the reference services initiated electronically often in real-time, where patrons employ computers or other Internet technologies to communicate with reference staff, without being physically present. They also involved a split web screen, in one screen users' type question and can instantly see librarians' responses, in the second screen, librarians can call up web pages or other electronic references where the required information can be found without barrier to time and place.

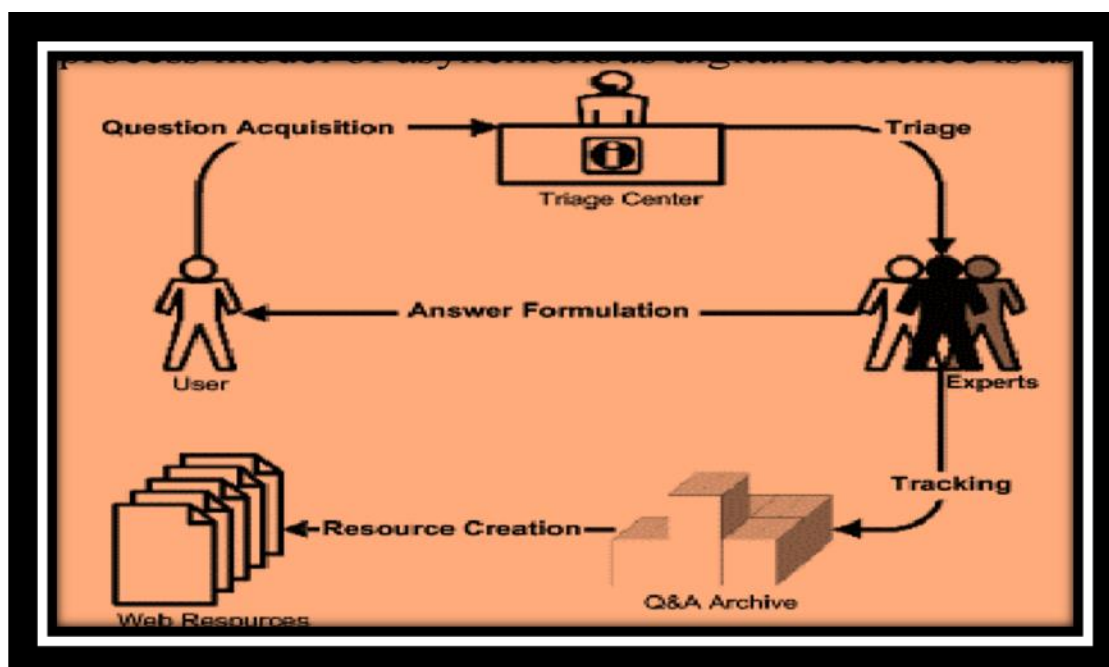
The provision and use of digital reference services in academic libraries are effective and innovative ways of expanding library services to more users including people with physical disabilities, scheduling constraints or geographical distance to access their information needs at any time and any place. This is because digital reference services can be achieved personally,

informally and conversationally (Mawhinney, 2020). Digital reference services are personalized and timely services, which can be provided and accessed online 24/7 with no barrier due to time and place (Abubakar, 2021; Jain, 2013). Digital reference services involve user-friendly interfaces, and ensures higher user satisfaction (Mu, Dimitroh, Jordan & Burclaff, 2011; Nicol & Crook, 2012). With the innovation of ICTs, it is expected that academic libraries can digitalise their resources and services to enable them provide effective and efficient services to users. It can also be premised on the fact that accessing information in traditional reference settings are no longer sufficient for users to compete with their counterparts on a global level. Reference services in a digital environment also afford clientele who are shy in physically approaching a reference librarian the opportunity to submit their reference questions online for possible information needs.

Model of Digital Reference Services in Academic Libraries

The general model of asynchronous digital reference services was developed by J. Pomerantz, S. Nicholson, Y. Belanger and R. D. Lankes in 2004. The general digital reference model was developed from the virtual reference desk project of Lankes (1998). The general model process is presumed to be applicable to all asynchronous digital reference services with different services employing a variety of processes at each stage of the reference services. According to Pomerantz et al. (2004), the model digital reference consists of five (5) steps such as: question acquisition, triage, answer formulation, tracking, and resource creation. The model is diagrammatically presented in Fig. 1.

Figure 1: General Process Model of Digital Reference



Source: Pomerantz, J. et al., 2004

As in Figure 1, the various elements or steps of digital reference services are briefly discussed as follows:

- i. **Question acquisition:** This is the first step of the general process model of asynchronous digital reference. It is also known as reference service transaction, a process of communication between a user and a librarian. It involves taking or receiving questions from a patron using e-mail, Web forms, chats or embedded applications, and consulting the information sources at his disposal in order to provide answers. Question acquisition facilitates the process of effective digital reference services.
- ii. **Triage:** This step follows the question acquisition process. It is the assignment and routing or directing of a question to a dedicated digital reference service, and to a reference or subject expert within a service. This step may be automated or conducted

- via human decision support. It may also include the filtering out of repeated or out-of-scope questions.
- iii. **Answer formulation:** This is the third step of the general model process of asynchronous digital reference service. It involves all actions taken by the expert to generate a response to a question including sending the response to a reviewer or directly to the user. Answer formulation stage also include considering factors for creating good answers such as age and cultural appropriateness. This step equally includes sending answers to the users. It requires well-knowledgeable and well-trained librarians with technological proficiency in order to provide accurate, and comprehensive answers to the patrons. In essence, answer formulation must take into consideration the elements of quality of the answers, completeness of the answers and correctness of the answers provided by the librarians in order to satisfy the patrons' needs (Luo, as cited in Uutoni, 2014).
- iv. **Tracking:** This is the quantitative and qualitative monitoring of repeated questions for trends. Tracking allows the identification of "hot topics", and may indicate where gaps exist in the collection.
- v. **Resource creation:** This is the last step of the general process model of asynchronous digital reference. It involves the use of tracking data to build or expand collections in order to enhance better satisfaction of users' information needs.

Elements of Digital Reference Services in Academic Libraries

Just like other library services, digital reference services anchor on some essential elements, which symbiotically interact to give rise to successful and satisfying digital reference service delivery. According to Berube, as cited in Okoli et al (2021); Singh (2012); Uutoni Mensah, C.P.

(2014), digital reference services comprise of four key elements, namely; the user/client, the interface, the reference librarian and the information resource.

- **The User/Client:** This refers to the person(s) whose information needs triggers a query or question. He is the consumer or patron of the service on site or remote user. The user initiates the reference query or question using either the asynchronous and synchronous mode.
- **The interface:** The refer to the various forms, platforms or media through which digital reference services are requested by the library user and/or provided by the digital reference librarian. The interface may be an asynchronous mode such as e-mail, web-form, etc. It may also be the synchronous mode such as instant messaging, video conference, chats, VOIP, digital reference robots, etc.
- **A librarian or information professional:** This refers to the digital reference librarian with required skills who responds to queries by finding and providing answers to a library user. The digital reference librarian may provide answers to users' queries through either the asynchronous or synchronous modes.
- **Information resources:** This refers to the sources of information from which a digital reference librarian can obtain answers to the user of the service. The information resources could be printed documents or e-resources such as CD-based resources, web-based resources, databases, local digitised materials, etc.

Gains of Digital Reference Services in Academic Libraries

Generally, the gains of digital reference services in the academic libraries cannot be overemphasized. Oluwabiyi (2017) noted that digital reference services provide support for users

who find online tools and resources unfamiliar, difficult to learn, or insufficient to answer their information needs. It provides valuable user feedback to collection builders so that they may better tailor their resources and maximize their investment in content creation. Digital reference services are the fastest growing and innovative services developed in the libraries. This is because a digital reference transaction occurs almost immediately when a question is received electronically and responded to electronically by a librarian (Bertot, McClure & Ryan, as cited in Oluwabiyi, 2017). They increase access to academic library services in such a way that is not dependent on physical visits to the academic library. Digital reference services also allow librarians to help patron's access information in a virtual environment, using various methods such as e-mail or chat.

However, Oluwabiyi (2017); as well as Sloan (2012) summarized the specific gains of digital reference services to academic libraries to include:

- i. Digital reference services facilitate individual assistance and instruction to users.
- ii. Digital reference services help in providing and maintaining appropriate collection of reference resources in both print and electronic formats.
- iii. Digital reference services provide assistance to users in locating the best sources of information for their needs.
- iv. Digital reference services help in marketing reference resources in academic libraries.
- v. Digital reference services act as a public relations tool in academic libraries.
- vi. Digital reference services help in facilitating online searching.
- vii. Digital reference services also help in assisting professional activities for development and growth in academic libraries.

- viii. Digital reference services help in fast-tracking referral processes by forwarding enquiries and providing users with live links to authoritative websites.
- ix. Digital reference services also help in educating users concerning research techniques and processes.

Complementary Roles of Patrons and Librarians in Digital Reference Services in Academic Libraries

Effective delivery and/or implementation of digital reference services in academic libraries are dependents on how effective both patrons and librarians play their roles. According to McClennen and Memmott (2003), digital reference service is a role-based model. In other words, digital reference services focus on the roles that are played by participants based on the traditional process of librarian-patron interchange. Patrons-librarians interchange is essential in digital reference services.

However, to achieve effective digital reference services involves five (5) roles, which are:

- i. **Patrons:** These are the persons asking or originating the questions. Their approaches are important in digital reference services.
- ii. **Filterers:** Filterers are useful in handling repeated or trivial questions in a digital reference service process. A filterer may be a person or an automatic process which filters or screens the non-questions, that is, repeated questions, inquiries about previous transactions, unclear, out-of-scope, or spam.
- iii. **Answerers:** These persons who assist the patrons with information needs. Answerers could be subject specialists and they concentrate on questions that require intellectual effort to answer.
- iv. **Administrator:** This is a person(s) who monitors workflow, clears the way for answerers and filterers to do their jobs. The administrator may assign questions and check

answers for content. He ensures the smooth running of the digital reference service process. He or she can add answers to frequently ask questions (FAQs), and/or creates user accounts and performs other technical tasks.

- v. **Coordinator:** This is a person(s) responsible for defining and implementing policies and procedures that involve the operation on the digital reference service. He is dedicated to defining and implementing policies and procedures, as well as takes initiatives for the improvement of the digital reference service process.

Standards for Evaluating Digital Reference Services in Academic Libraries

As part of the innovative services that academic libraries should provide for the satisfaction of changing information needs of users, digital reference services are expected to meet certain standards and guidelines. Accordingly, the International Federal of Library Association and Institution [IFLA] digital reference guidelines (2008) and Reference and User Services Association [RUSA] (2004), in their deliberate quest to promote digital reference services best practices on an international level, set up guidelines to regulate digital reference services. IFLA and RUSA's guidelines are the standards that need to be followed by academic libraries across the world in providing digital reference services in order to ensure uniformity of digital reference services. The IFLA and RUSA guidelines suggest that digital reference services' evaluation should be equivalent and part of a library's regular evaluation of all its reference services. The guidelines further require that libraries should conduct user surveys of patrons and staff and monitor concerns, problems and questions from staff and patrons. This evaluation should be used to improve the services as needed through adjustment of staffing, levels of staffing, service parameters, training, and other improvements as indicated by the evaluation results.

As a matter of fact, these guidelines have become necessary in ensuring better implementation and maintenance of digital reference services in all academic libraries. Thus, the guidelines are summarized as follows:

- i. Digital reference services' responsibilities should be shared among library staff to ensure continuity of service.
- ii. Library staff, especially those mounting the reference desk should be trained for all reference services such as face-to-face and digital in order to provide greater depth of knowledge and flexibility for staffing.
- iii. Library staff conducting digital reference services should be selected on the basis of ability, interest, availability and skills to use the supporting technologies.
- iv. Library staff should be provided time and resources for training and continuing education to ensure effectiveness and efficiency in digital reference service.
- v. The library should meticulously determine who trains librarians and set aside the time and schedule for staff training, orientation and professional development.
- vi. A digital reference librarian should necessarily possess basic skills in digital reference services such as multi-tasking, clear communication skills especially in writing, database and online searching skills, interviewing skills to compensate for lack of visual and auditory cues, and knowledge of references sources.
- vii. Update training as necessary, and encourage and enable staff members to meet regularly to discuss their experiences and new developments in the field of digital reference services.

Skills and Competencies Required for Effective Digital Reference Services in Academic Libraries

Effective digital reference services depend greatly on some essential skills and competencies. These skills represent the abilities, aptitudes and confidence in planning and marshalling digital reference services for teeming users. According to IFLA guidelines (2008), as cited in Uutoni (2014), key skills and competencies stipulated for a digital reference librarian include: multi-tasking skills; clear communication skills, especially writing skills; database and online searching skills; interviewing skills (to compensate for lack of visual and auditory cues); and knowledge of reference resources.

However, relying on the IFLA guidelines, Luo, as cited in Uutoni (2014) identified the following the skills and competencies for digital reference services:

- **Reference interview skills:** This is a set of skills that facilitate referring users to appropriate resources; using open probes to clarify questions; recognising when follow-ups are necessary, offering a personal greeting at the beginning of a chat session to provide clear interest and willingness to help; and confirming the satisfaction of users' information needs.
- **Knowledge of electronic resources:** This is the ability of a virtual reference librarian to select and search databases and Internet resources. It involves effective understanding of subscribed library databases; a wide-ranging knowledge of Internet resources; and rapid evaluation of the quality of information resources and services on the net. Effective digital reference services require sound and up-to-date subject expertise in the information gathering process. This also requires a good knowledge of the entire collection of the library.

- **Ability to work under pressure:** This implies that a digital reference librarian should possess stamina and ability to think quickly and deal flexibly with unexpected situations in chat reference sessions. He or she should also be able to manage multiple tasks and manage time effectively. It also involves the ability to deal with stressed, demanding and confused users.
- **Online communication skills:** This is a set of skills for mastering online real-time written communication and understanding or appreciating online culture and chat etiquette. It also involves the ability to write concise and clear messages.
- **Instructional role skills:** This is another vital skill for digital reference services. This set of skills include ability to take the instructional role to educate users to augment their level of information literacy and the ability to provide peer instructions to colleagues in obtaining chat reference skills.
- **Ability to recognise different groups of users:** This refers to librarian's ability to understand different users and answer their questions using different techniques and approaches in order to satisfy their individual's needs.
- **Ability to handle irregularities of user behaviour:** This involves the ability to deal with any kind of inappropriate use of digital reference services such as abusive and excessive demand from users, as well as rudeness of users, among other unbecoming attitudes.
- **Digital technology skills:** This is the ability to make use of and thrive in a digital environment. It means possessing advance technological skills that are required for current practices. This set of skills facilitate the whole elements of digital reference services.

In addition to the above essential skills for digital reference services, effective digital reference services also require collaborative skills, interpersonal relationship skills, marketing skills, proactive skills, active listening skills, and ability to respond to diverse queries with neutrality in opinions about the information provided.

Factors Militating against Digital Reference Services in Academic Libraries

Several factors confront digital reference services in academic libraries. These factors are basically categorized under human, organizational and government.

According to Abubakar (2021); Ashiq, Rehman and Mujtaba (2020); Mawhinney (2020); Madu et al., (2018), the human factors that affect digital reference services in academic libraries include: behavioural changes, poor ICT or digital skills of reference librarians, including online searching and networking skills, privacy and security concern, and poor social media skills. It must also be noted that most academic libraries, especially from developing countries like Nigeria, are lagging behind in workforce training and development in relations to information technology skills, equipment, adequate social media skills, which are necessary for the provision of effective digital reference services.

Organizational factors affecting digital references services in academic libraries include: too much workload on available professional librarians, inadequate communication technologies, inadequate guidelines and training of library staff, internet interruption, non-functional library website, lack of functional e-mail to support real-time interactions with clients, human resource problems and continuous budget decline resulting in inadequate funding (Williams, 2020; Madu et al., 2018). These factors are practically detrimental to digital references services in academic libraries.

For the governmental factors, digital reference services in academic libraries are challenged by lack of internet-based resources and support system, regulatory adjustments, poor internet access, high bandwidth cost, low bandwidth penetration and irregular power supply (Anna & Srirahayu, 2020; Madu et al., 2018). Abubakar (2021) specifically observed that over the years, sufficient and uninterrupted power supply has continued to elude many developing countries, particularly countries in the Sub-Saharan Africa, including Nigeria.

Strategies for Enhancing Digital Reference Services in Academic Libraries

The effectiveness of digital reference services in academic libraries can be enhanced through deliberate actions by all stakeholders in the academic system, which include following measures:

- i. Adequate funding of academic libraries by government in order to facilitate the acquisition of relevant Information and Communication Technology (ICT) tools for enhanced digital reference services provision. This is because the academic libraries require ICT tools to function in a digital environment where digital reference services are parameter for users' satisfaction.
- ii. Governments should provide technological infrastructures by prioritizing investment in computers, fibre internet, and broadband, and electricity generation.
- iii. Library management and librarians should be involved in the planning and implementation of digital reference services in academic libraries. The planning should focus on both human, material, equipment and financial resources that facilitate successful digital reference services.
- iv. Management of academic libraries should formulate and clarify necessary policies and methods through which digital reference services are provided. This implies deciding

- and clarifying whether to provide digital reference services through persons or through automated-expert systems such as chatterbots, digital reference robots, etc.
- v. There should also be deliberate and regular evaluation of user's needs through pilot studies and feedback from the users. This is to ensure that academic libraries provide satisfactory digital reference services to users.
 - vi. There should be deliberate sensitization and promotion of digital reference services to institutional administrators. This requires creation of more awareness and advocacy for improved investment in academic libraries.
 - vii. There should be improved provision of necessary information and communication technology (ICT) tools since the provision of digital reference services depends on availability of tools.
 - viii. There should be training and retraining of librarians, especially reference librarians in order to enhance their skills and versatility in the ICT. This can be done through seminars, workshops, mentoring, train the trainer, conferences and further education are absolutely necessary for the provision of digital reference services. Training of librarians should at least focus on online communication skills, reference interview skills, web searching skills, knowledge of electronic resources, collaboration skills, and knowledge of digital reference policies and procedures.

Conclusion

Digital reference services represent a paradigm in academic libraries and part of the gains of the advancements in information and communication technologies. Digital reference services involved providing reference services – personalized assistance to library users through e-mail, web-forms, Web chat, video conferencing, instant messaging, digital reference robots, etc. The

services facilitate more users' satisfaction through timely, quicker, more convenient and better reference services delivery. Through the digital reference services, academic libraries can contribute more to teaching, learning and research, as well as extend their services beyond the library environment, library physical space and library operating hours.

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