
Nadim Akhtar Khan, university of Kashmir
Mohsin Ashraf, university of Kashmir
Introduction

In present knowledge based society there has been an unprecedented growth in the quantum of knowledge resources on all aspects and as such libraries and information centers have experienced drastic changes in respect of their holdings, management techniques and information retrieval procedures. The developments in Information Communication Technology and growth in the availability of online information resources has complicated the process of locating desired information. The ultimate aim of any library setup in present web based environment is to serve its users and give them maximum satisfaction out of the available resources. Now-a-days most of the users seek pinpointed information from libraries and as such libraries witness a plethora of queries, reference service stands to find answers to such queries and even direct them to various sources of information or expert groups. The reference environment is being transformed by rapid developments in web including growth in web 2.0 tools which has emerged as a powerful tool to enhance navigation and communication over the Internet. As major component of library services, reference services are constantly developing as is the library itself, moving from the traditional, to automated, to hybrid, and eventually to digital. Within the past few years, numerous Web-based digital reference services have been established by libraries. According to Bertot, McClure and Ryan, the term digital reference service refers to a network of expertise, intermediation and resources put at the disposal of a user seeking answers in an online/networked environment (as cited in Dollah & Singh, 2005).
Digital reference is defined as Internet-based question and answer services that connect users with individuals who possess specialized subject or skill expertise (Wasik, 2000). A digital reference system generally comprises of: User of the service, Interface (email, web forum, chat, video conference etc), Information professional and Electronic resources (Berube, 2003). The digital reference service has emerged as a new powerful method of delivering reference and information service to a vast number of clientele distributed globally. It includes seamless access to global resources and the collection of knowledge for reference access, coupled with complementary access to information on the Internet.

Problem
The Digital Reference service has brought about tremendous change in the concept of reference services in terms of information dissemination and user satisfaction. The present problem is however focused on studying the genesis, development and models of Digital Reference Service.

Objectives

1. To trace the genesis and development of Digital Reference Service.
2. To present various Models of Digital Reference Service.

Methodology
The study was carried out in two phases.
1. In Phase I, information regarding the development of the concept and the past works carried out on various aspects of Digital Reference Services was collected.
2. The Second Phase was concerned to the study of existing Models of Digital Reference Services.

Literature review
Providing digital reference service in modern era has became a prime need. Berube (2003) lays more stress on incorporating digital reference as a standard service in library plans which will prepare librarians in catering the needs of its patrons in a much quicker and easier way. Yost (2004) stated that digital reference service has introduced new opportunities as well as challenges for librarians, users, and vendors. Librarians should embrace this challenge and seek
out new and improved methods to provide reference service. Kasowitz (2001) discusses the concept of digital reference in practice and research, including provision of real-time reference service, collaborative efforts among networks of libraries and organizations, and development of quality and technical standards, highlighting benefits of providing digital reference service through collaborative services. Further Berube (2004) provides an overview of digital reference practice, procedures, and issues, with particular emphasis on collaboration. The concept is further supported by the study of Singh (2004) elaborating some of the emerging digital reference services, including e-mail and web forms, text-based chat services, web-camera based services, digital robots, and collaborative services. Lankes (2004) presents a theoretical approach to what digital reference is currently and may become in the future. Two key issues are presented, the scalability, (defined as the ability for services to grow). The second is ambiguity, (defined as the ability to identify the resources needed to meet users' needs before answering questions). Both of these have existed in the print or old version of the reference desk or section but now take on greater challenges in the electronic, digital, or virtual reference mode. Dollah and Singh (2005) also highlights the budding formats and models of digital reference services, including e-mail and web forms, AskA services, online chat reference, video conferencing, digital robots, and collaborative digital reference. A step further Spencer (2006) provides a historical context for the information common models in college and university libraries, reviewing trends in reference services, user expectations, technology and facilities planning.

**Concept & Development of Digital Reference Services**

Digital reference refers to a network of expertise, human intermediation and resources placed at the disposal of users in an online environment. Further Ali (2006) refers digital reference as a network of expertise, intermediations and resources put at the disposal of a person seeking answers in an online environment.

A digital reference service generally comprises four elements:

1. The user of the service
2. The interface, in the form of an e-mail, a web form, a videoconference, etc.
3. A librarian, or information professional, and
Digital reference services can take many forms, but they can be divided into two broad categories (Francoeur, 2002)

a) **Asynchronous transactions**: In this form of service there is a time delay between the question being posed and the answer being given. Asynchronous transactions generally take the form of email, web forms, Ask A services,

b) **Synchronous transactions** which take place in real-time with an almost immediate response to a query or a request. Synchronous transactions generally take the form of **Chat reference** using simple technologies, **Chat reference** using web contact software, **Video-conferencing or web-camera services**, **Digital reference robots**

1.8 **Development**

There has been a considerable development in digital reference since its emergence; according to Still & Campbell One of the first services to go online was the Electronic Access to Reference Service (EARS), launched by the University of Maryland Health Services Library in Baltimore in 1984. Three years later, the libraries at Indiana University developed an e-mail system called LIRN (Libraries Information and Reference Network), which was menu-driven and part of a network system (as cited in Yost 2004). Digital reference services grew over time and became increasingly popular, eventually leading such internationally-known services as AskERIC in 1992 and the Internet Public Library in 1995 (Wasik, 2003). In recent years digital reference services have become effective resources for meeting the information needs of remote library users. Interest in digital reference increased steadily. A number of conferences were held from time to time in order to discuss this new paradigm. In 1999, the conference of the Virtual Reference Desk (VRD) drew large number of people. The following year attendance doubled. Consequently, the use of digital reference service increased dramatically. By 1999, 75 of the 122 libraries of the Association of Research Libraries (ARL) offered digital reference via e-mail or used a web-based system and by mid-1999, 358 of 473 academic libraries provided digital reference (Fritch & Mandernack, 2001). Since a large number of libraries across the world have implemented digital reference service in order to make their clients satisfy and cater their information needs in much more sophisticated ways. Digital reference evolved from basic e-mail
correspondence to more sophisticated systems that allowed librarians to show search results to users. Today almost every library tends to opt digital references service because of its tremendous advantages. A number of libraries have started to provide digital reference service to its patrons

**Models**

**Process Model for Digital Reference Services**

Michael McClennan's "Roles in Digital Reference" defined a role-based model of digital reference. This model focuses on the roles that are played by the participants based on the traditional process of librarian/patron interchange. McClennan identified five roles: Patron, Filterer, Answerer, Administrator, and Coordinator.

**Question Interchange Profile (QuIP)**

The Question Interchange Profile (QuIP) concept was first introduced in 1988. The 1.01d version created by VRD team (Lankes/Sutton) came in 1999. In 2000 QuIP was considered by OCLC. David Lankes explored the workings of the Question Interchange Profile (QuIP). It is an interchange protocol for questions and profiles in the context of networked digital reference services. It is based on a decentralized collaborative model that is designed to work across domains. QuIP has three major components: Metadata schema (Elements and Semantics), Syntactic bindings (XML binding) and Protocols. (Service protocols for delivery and manipulation).

**Question and Answer Databases**

Question and Answer Databases by Lorraine Normore explored issues related to maintenance, privacy and economics and presented information on current types of databases including FAQs, flat files with minimal search capabilities; MARC-like files which contain bibliographic-like data markup; and KBIT (KnowBit), a highly edited, cataloged and indexed files.

**KnowBit**

KnowBit format for a Question and Answer database was described by Brett Butler. KnowBit is designed to be an integrated, scalable, linkable, and extensible standard allowing information components to be combined in a single format. It includes choice in the use of thesauri and classification schemes as well as links to components from MARC and other related standards.
The KnowBit format recognizes the types of questions: the original question; reference-interview process questions and the formal question and provides for identification of the question by the purpose of the question and the type of question asked. Descriptive fields allow for identification of the geographic origin; language, copyright status, and availability status of the question in order to manage its content within a database. In addition, classification, evaluation, and statistical analysis can be enabled with the use of topical classification, key terms, item, author and source evaluations, and frequency data, presenting ways to capture, identify and classify information in a question and answer database.

Digital Reference Question & Answer

A process model of digital reference service by Linda Arret is based on the research and work of the Collaborative Digital Reference Service. The model operated under a number of basic assumptions including the process is member-to-system-to-member system for presenting requests; agents (staff) work for members (institutions); a request is assigned to members by the system by matching request information to member profiles; requests go through processes and states and have actors; and business rules apply both to the processes and the actors.

A request (which may involve up to three related questions) may go through many states. In its initial state the request is unassigned. The question is acted on by the system and matched against all active member profiles and moves to the "assigned state". In the assigned state the member may assign the request to an agent of the member organization and the request is in process. The request is closed upon completion of the answer being submitted, or the question may be rejected by the responding library or cancelled by the initial requesting library.

OPAL - Online Personal Academic Librarian

OPAL (Online Personal Academic Librarian) was an eighteen month research project based at the UK Open University Library which is exploring the development of a fully automated online 24/7 reference service for distance students. The project team was developing and testing a prototype automated reference system designed to answer common questions from OU distance learners. The OU has around 200,000 distance students based in the UK and across the world, and around 50 percent of library enquiries are received out of office hours from students studying in the evenings, at weekends, or in different time zones. Using OPAL, students will be
able to submit their enquiry to the OU Library at anytime and in anyplace, and expect to receive an immediate automated response. The system will use filters to detect and provide answers to common and predictable questions, while redirecting more complex enquiries to library staff. As a second stage in the project, the team also planned to use agent based architecture to create a generic "artificial librarian", capable of answering more complex questions about library resources. This stage of the project draws on work into artificial intelligence question-answer systems carried out at the OU Knowledge Media Institute. It was planned for the final system to be integrated with university student authentication systems, enabling user profiling and the delivery of user specific answers (Payne & Bradbury, 2002).

Conclusion
There has been a radical change in Library services with the advancements in Internet and web technologies. Libraries are expanding their horizon and are reaching out to globally distributed segments of population by way of making optimum use of web 2.0 tools in providing effective services and as such Digital Reference Services has brought about a radical change in user persuasion towards the utilization of library resources using current day cutting edge technologies including mobile technologies, IMS, Social Networking tool kits, Open Source Software and allied technologies which are handy in implementing and carrying out not just point-of-access services but also point-of-need services.

References


