

# Information Use Management and Policy Institute

## ASSESSING QUALITY IN DIGITAL REFERENCE SERVICES

<http://quartz.syr.edu/quality/default.htm>

### Phase II: Site Visit Summary Report

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By

**Melissa Gross** <[mgross@lis.fsu.edu](mailto:mgross@lis.fsu.edu)>  
Assistant Professor and Senior Research Associate

**Charles R. McClure** <[cmclure@lis.fsu.edu](mailto:cmclure@lis.fsu.edu)>  
Francis Eppes Professor, and Director

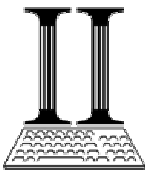
**Ruth Hodges**, Research Assistant

**Antoinette Graham**, Research Assistant

School of Information Studies  
Information Use Management and Policy Institute  
Florida State University  
Tallahassee, Florida 32306

**R. David Lankes** <[rdlankes@ericir.syr.edu](mailto:rdlankes@ericir.syr.edu)>  
Assistant Professor, and Director

Syracuse University  
Information Institute of Syracuse  
Syracuse, NY 13244



School of Information Studies  
Florida State University  
**Information Institute**  
<http://www.ii.fsu.edu>

## **INTRODUCTION**

The overall goal of the Assessing Quality in Digital Reference Services Project is to better understand and describe the nature of quality digital reference services in order to develop practical and reliable methods, measures, and quality standards to assess these services. To this end, seven site visits were performed at libraries actively involved in providing digital reference as part of a baseline data collection effort in order to:

- Describe best practices in the field.
- Develop proposed measures and quality standards.
- Field-test proposed measures and quality standards at selected participating libraries.
- Produce a concise guidebook to assist libraries in assessing and describing digital reference services in terms of specific measures and quality standards.

Accomplishing these goals and objectives is essential if digital reference services are to evolve successfully and be fully integrated into library services.

This preliminary report compiles and summarizes the findings and issues revealed in the seven site visit reports, and supplements the Project's literature review (issued separately). For more information, visit the Project's web site: <http://quartz.syr.edu/quality/>.

## **METHOD**

Data were collected from seven sites: two academic libraries, four public library systems, and one State library. Participating libraries were asked to provide any existing formal documentation concerning their digital reference services. This documentation includes a variety of items such as written library policies and procedures, descriptions of the digital reference services, related promotion and publicity materials, training and personnel manuals, budget and accounting information, plans for the evaluation of digital reference service, and management reports describing the library's experience in developing, providing, and evaluating digital

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reference services.

Each library identified a liaison to set meetings and to determine the number and type of participants, plus a data collection plan. On-site data collection methods varied and included surveys, interviews, and/or focus groups with key informants and representative subjects.

In all cases, the topics and general question areas outlined in the question guidelines (see Appendix II) guided the scope of this investigation, including survey, interview, and focus group content. Every question, however, was not necessarily asked at every site, as the focus of this data collection activity was to develop an understanding of how digital reference services are being provided and how they can best be measured, rather than to answer a specific set of questions. The questions come from a detailed analysis of research and writing on the topic of digital reference services. Two particularly helpful sources were Marilyn White's framework for assessing digital question and answer services, and the framework provided by David Lankes and Abby Kasowitz for ASKA services.<sup>1</sup>

### **KEY FINDINGS**

Data collection at each site was documented in a written report by the researcher(s) responsible for the site. In each case these reports summarize what the site visit contributed to the Project's understanding of how digital reference services are being provided and how they can best be measured. Formal site documentation, survey responses, and other supporting records collected at the site are maintained as part of the file for each site visit.

### **Planning for Digital Reference**

The motivation for providing digital reference services at all of these libraries developed

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<sup>1</sup> The complete citations for these works are as follows: White, M. D. (1999). Analyzing electronic question/answer services: Framework and evaluations of selected services. CLIS Technical Report no. 99-02. College Park, MD: College of Library and Information Services, University of Maryland. Lankes, R. D., &

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internally -- at times in the form of a mandate from above -- and does not appear to be the result of a user needs assessment or community analysis. One example of comments in this area was recorded in a focus group meeting. The researcher reported that respondents felt, “there was pressure to have a digital reference service. This pressure came from the public (though no one was able to express how this pressure was manifest, nor means of evaluating user desires in reference in general). The pressure is also coming from library administration to have such services. Often times this pressure from ‘above’ comes with no additional resources. There was also a general agreement that moving to digital reference was needed as a means of demonstrating the value of reference and to ‘re-introduce’ reference to the library and community.”

In general the planning for these services was informal and documentation from the early stages of the endeavor is no longer available. At most of these libraries the provision of digital reference service is not viewed as being substantially different from traditional reference service, and it is assumed to have the same goals and objectives. Interestingly, at the two libraries that emphasize chat reference, librarians were more interested in special training for digital reference.

### **Current Digital Reference Services**

All of the participating libraries offer digital reference services via email, even if they also offer digital reference services through another medium such as chat. Email reference is often provided in more than one form. A user may submit a reference question either:

1. By filling out and submitting a web form developed for this purpose and available on the library’s web page, or
2. By sending email directly to a specific librarian or the Webmaster.

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Kasowitz, A. S. (1998). *The ASKA Starter Kit: How to Build and Maintain Digital Reference Services*. Syracuse, NY: ERIC Clearinghouse on Information & Technology, 1998.

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Two of the sites also offer users live chat sessions as a reference option and two more are exploring adding this service soon.

Each library has a defined user base, but also accepts questions from outside if staff feel they can reasonably answer them. With the exception of one 24/7 online chat service, all the libraries respond to queries only during normal business hours, which is when most are received. Fewer email inquiries are received on weekends and the fewest after midnight. Two libraries question the need for around-the-clock reference responses. Seasonal increases depend on the user base; academic libraries, for instance, receive more reference questions during the school year just prior to final exams. In all cases the volume of digital reference question is low, ranging from three to 33 per day.

Each site attempts to answer all inquiries received in a timely fashion. Most sites stipulate the type of question (ready reference or fact based) that is best served by digital reference. For the most part, this is the type of question they receive and for email reference they are usually answered in less time than the library's policy dictates. More in-depth research questions take longer but are not generally rejected. The synchronous nature of chat generally means that questions are answered on the spot.

The accuracy of digital reference responses is not formally measured by any of these libraries in terms of keeping formal statistics such as successful completion rates. However, because digital reference services are less ephemeral than traditional reference, the resulting record of the transaction is available to the librarian and the user -- and generally to both supervisor and staff. The presence of this record is playing a part in quality control at some libraries where these records are periodically checked by the supervisor, or the quality of digital reference services is determined by peer review and self-evaluations by the librarians

themselves.

Three sites report assessing the librarians' performance of digital reference by reviewing retained email question and answer sets. Two sites provide librarians with examples of what are considered "good" responses to give them an idea of what quality reference work looks like when performed via email. Considerations include not only issues of accuracy and completeness but also the use of an appropriate tone, good grammar, and the inclusion of established scripts (like a specific opening or closing statement) in the librarian's response.

### **Staffing**

Digital reference staff is expected to have the same qualifications required of those performing traditional reference services. That is, they generally have an MLS or an equivalent professional degree. Some libraries have specific training for new digital reference personnel; others offer only technical instruction on how to use the computers and software. However, the site visit reports indicate that training is an issue at three of the sites. The librarians at these sites say that because, "a significant portion of their time has now gone to providing technical and systems/network assistance to users about databases, printers, and connectivity problems" that they need more training in order to support the increasing number of technology related questions they handle. Not all librarians are comfortable with this however. Statements were also made that handling technology issues with users is "outside their job description as reference librarians" and one researcher comments, "many felt "stressed" that they did not have the knowledge or qualifications to provide technical advice."

Staff comment that, "a range of additional training in areas such as conducting online question negotiation, using a combination of online and print sources interactively, and other topics need attention as well. Staff also agreed that they would need training in conducting

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evaluation and analyzing/reporting data. They were also quick to point out that most schools of library and information studies offer virtually no training/education in this area.”

At the two of the public libraries digital reference is mainly incorporated into the telephone reference center; at all locations digital reference is incorporated into existing services and provided by existing staff. Librarians are able to cover digital reference in addition to face-to-face and/or telephone inquiries because response has been low and its impact on staffing minimal.

There is little consistency in how questions are distributed to librarians: Some libraries route to appropriate staff based on topic. Some impartially distribute questions as they are received. At another location reference librarians “claim” the questions they choose to answer.

### **Marketing**

One public library system that offers online chat launched their new service with an intense media campaign that proved effective, resulting in a short-term spike of 200 uses per day. Currently they average approximately 33 questions per day. The marketing campaign stressed convenience; that people do not need to physically enter a library building in order to access its collections. Further marketing plans are under development.

At the State library digital reference services are consistently marketed to the target user group and the visibility of the service has been tied directly to the volume of questions received. The other libraries depend on the visibility of links from their web pages to attract users; in the case of one public library system, the web form is three links down from the home page. Also traditional library marketing tools (bookmarks, newsletter mentions, outreach talks) are used to promote digital reference at these sites. One academic library is concerned that increased demand for digital reference services would have a detrimental impact on their resources. One

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public system would like to measure the effect of marketing on the use of chat, plus user satisfaction and overall quality of library services.

### Statistics and Evaluation Measures

The procedures for recording statistics show little consistency across the sites. The State library tracks, analyzes, and archives only those questions received from primary and secondary user groups. These libraries do not perform any log analysis, although one library does have plans to do log analysis in the future. One site offered statistics as to the number of repeat users (10-15%), how many came from out of state (33%), and how many came through direct email (10%) -- but all of these were staff estimates unsupported by data. Of common interest is the volume of questions received, but even the methods for this accounting are not consistent. Web form software automatically counts the number of transactions received, but emailed questions are often handled differently. At least one academic library does not count inquiries sent directly to librarians through email. The fact that email reference arrives from more than one source (web form and email, and/or via multiple email addresses) complicates efforts to determine the actual volume of digital reference questions received.

Data about users are also not uniformly collected and for the same reasons cited above. At two libraries staff thought their online chat users were more technologically sophisticated than users of traditional reference services, but they have no empirical evidence to support this opinion. They did express concern that disadvantaged populations might have reduced access or that chat reference favored a particular sector of the population. All the libraries visited maintain user confidentiality. To preserve user privacy, two public systems delete the questions received after the monthly count. This procedure unfortunately destroys historical data about these services.

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One academic library surveys digital reference users and the State library conducts quarterly surveys and solicits feedback from a web page link. One public library goes to great lengths, using focus groups, surveys, and unobtrusive testing to understand and ensure that the needs of the community are served. Other libraries express little interest in evaluation and have established no evaluation procedures. In fact, some of the site participants told members of the study team that they really had limited resources to dedicate to evaluation of their services.

Staff attitudes from the two libraries using a chat interface for reference transactions varied dramatically. The academic library staff expressed general dissatisfaction with their chat service, citing technical difficulties, a perception of lower quality of service, and difficulty in maintaining complex interactions with users. One reference librarian from this site does not consider email and chat to be legitimate "reference" services. This staff considers digital reference to be an experiment and is concerned that foreign students will have difficulty communicating. The public library system, however, has an enthusiastic staff that plans to expand and further publicize their chat service, which they prefer to email. They find chat an exciting and natural outgrowth of traditional reference services. The State library and one academic library are not convinced that chat would add real value to existing reference services and question the need to provide services all hours on all days of the week.

Almost all libraries express strong interest in developing assessment methods, but they differ as to which measurements would be of greatest benefit. Staff at one public system think that categorizing queries would help with collection development and staff training. Two libraries want to know why users choose one reference format over another. Numerous possible measures were suggested: demographics of users (especially distance), percentage of chat exchanges that end with hang-ups, accuracy of answers, utilization patterns, and length of time

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for answering questions. Almost all libraries are interested in the volume of questions received and in tracking what time the questions are received.

Suggested methods for collecting data included user assessments and surveys, self-assessment logs kept by librarians, peer review of transaction logs, unobtrusive testing of the service, and determination of accuracy of responses. User demographic data were of little interest to the State library, but reference librarians there would like to know how many visitors to the web site find answers to their questions without resorting to use of digital reference services. A summary of the types of evaluation methods these libraries are currently using are outlined in the table below:

### Evaluation Methods Employed for Digital Reference: All Sites

Evaluation Method	# of Libraries
User Surveys	3
Unobtrusive Testing	1
Log Analysis	0
Content Analysis	0
Usability	0
Focus Groups	1
Descriptive Statistics	7
Peer Review/Assessment	2
Staff Performance Review	3
Librarian Discussion Groups	0
Technical Analysis of Hardware/Software	0
Cost/Cost Effectives Measures	0
Cost Benefit Analysis	0

### Cost Analyses

Across all sites the collection of cost data was minimally performed and only reported in general terms. Several sites indicate that they expect to be held more accountable for specific cost data in the future, but are unlikely to collect this data unless required. There is some fear that the findings of cost data and cost benefit analyses might not support the continued provision

of reference services.

The cost for each digital reference transaction is difficult to determine. Two libraries report that cost for outsourcing digital (chat) reference through Library Systems and Services Inc. (LSSI) runs in the \$12.00 to \$15.00 range per question. How the price of this service was computed by LSSI is unknown. Digital reference at these sites is not considered separately from traditional reference for accounting purposes, and even where handled separately the costs are not calculated. The per-question cost for traditional reference services, in fact, is also unknown.

### **Technology**

These libraries have little to say about the technology used to provide their email reference services and report being satisfied with the systems and software they have in place. The libraries that offer chat services are more critical of the technology. At the academic library providing chat services, “They found the software to be OK but ‘clunky.’” The site visit report states that “One librarian commented that the software is not conducive to ‘speaking,’ the log-in process is time consuming, it can take too long just to connect to the service, for some reason some of the keys automatically log the user off the system, and making the person wait ‘endlessly’ while trying to answer the question is problematic.”

In the report on the site visit to the public library using chat software the researcher notes, “The librarians have a number of concerns and issues with the chat software. Whenever a new person enters the system, that person bounces off the person currently in contact with the librarian (if they are already working with someone). The procedures for handling multiple patrons at the same time is problematic and the degree to which this software will integrate with CDRS participation is also an issue.”

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The two chat products in use at these libraries are LivePerson and LSSI software. At one of the other sites the library is installing a product called Professional Edition but the implementation of their chat reference service has been set back by difficulties in installing the software on their system. At another site the library is considering the use of either LivePerson or LSSI software in the future.

The State library investigated the use of chat and concluded that it would not add any real value to their current web form and email reference services and thus will not be pursuing it.

### Lessons Learned

At all sites there is a high level of interest in evaluating the digital reference services they provide. Libraries want evaluative data that will help them describe their services to their stakeholders and funding agencies, improve services and collections, and better understand their users. However, sites also deal with practical limitations such as staff that are not trained in the collection and analysis of data and limited fiscal resources. The evaluation of digital reference then must involve the use of methods and measures that are:

- **Easy to collect, analyze, and report.** Evaluation is another responsibility to be integrated into the provision of reference service. Data collection, analysis, and reporting procedures need to maximize the quality and quantity of information they provide while minimizing the effort and special expertise they require from staff.
- **Accurate and reliable.** Data collection must provide measures of service that are demonstrated to measure what they are intended to measure and that do so in a consistent manner.
- **Address multiple dimensions.** There are many aspects of digital reference that

need to be measured to provide a holistic view of the service. Proposed measures and approaches must be sure to reflect the complex nature of the service. For instance, measures must provide information about both the process of reference service and the outcomes of reference service.

- **Meaningful to decision makers.** The results of digital reference evaluation activities must have utility for decision making within the organization and describing the service to the various stakeholders and funding agencies the support it.
- **Meaningful to staff.** The evaluation process must have utility for staff in terms of providing feedback to them that they can use to conceptualize service improvements. The extent to which the data is pertinent to their concerns will affect the level of sustained interest in integrating service evaluation into plans for service provision.

### Future Plans

All these libraries discussed perceived needs, short-term plans, and strategies currently under development. Most of the librarians anticipate increased interest in their digital reference services, especially as technology improves. Growth is not uniformly welcomed; one academic library expects additional stress since not all staff members have workstations. As demand for chat reference grows, one public system is prepared to rethink staffing and responsibility levels, although staff feel positive about expanding this service.

In addition to devising evaluation methods, future enhancements and improvements under discussion by these libraries include adding chat where not currently available, expanding service hours, formalizing procedural guidelines and staff training, and implementing formal

marketing plans. The State library is investigating the viability of allowing users to use PDAs to access reference services.

### ISSUES

In addition to the findings presented above, several issues are raised by the data that may have implications for evaluation, but which may not be resolved during the course of this project.

- **Around-the-clock reference.** Is 24/7 service necessary for every library environment? Is it reasonable to provide continuous service if utilization during off hours is low?
- **Librarians as technicians.** How much technical expertise should librarians be expected to have? How much technical assistance should they be expected to provide to users?
- **Library infrastructure to support ongoing evaluation and assessment.** Most libraries have not invested in an infrastructure (staff, methods, databases, assessment hardware and software, etc.) that would allow them to collect, analyze, and report evaluation data in a systematic manner.
- **Digital reference as distinct service.** Technical training on the use of specific software is necessary for staff providing digital services, but are special *reference* skills needed for digital transactions that differ from those used with face-to-face or telephone service?
- **Specialized training.** How can librarians acquire special skills related to digital reference that were not taught in graduate school? These include:
  - 1) How to conduct online reference interviews.
  - 2) How to use online and print resources interactively.
  - 3) How to handle the input of multiple questions.
- **Assessing transaction costs.** How much do digital and traditional reference services cost? How beneficial would a cost-benefit analysis prove to be for libraries? How will

those libraries whose future funding relies on such analyses calculate the costs of reference services?

- **Service format options.** Why do users of library reference choose a particular mode of service (face-to-face, telephone, digital, etc.)? Is this choice related to the type of question?
- **Possible consortia collaboration.** Should network agreements between libraries and consortia be clarified and structured so as to improve evaluation of digital reference services?
- **User needs and usability assessments.** Is a user needs assessment or community analysis necessary before digital reference services are initiated? How might a library evaluate the usability of its digital reference interface?
- **Lack of strategic planning.** What advantages would preplanning and formal objectives provide to libraries instituting digital reference services for their users? How best would the attainment of these objectives be measured?
- **High interest, low utilization.** How should libraries best increase the volume of digital reference users while maintaining quality service? Can the anticipated growth be controlled so as not to stress current reference staff and resources?

### **INCREASING KNOWLEDGE ABOUT DIGITAL REFERENCE ASSESSMENT**

The seven libraries studied in these site visits generally initiated virtual reference services with little preplanning or separation of digital from traditional reference. Response has been low but is growing. Library staff are learning from their experiences and observations, making adjustments as needed, and reflecting a wait-and-see attitude. Since evaluation and assessment measures are nonexistent, minimal or inconclusive, decisions for improving digital reference

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services are not based on objective standards but rather on what individual library staff feel might work best. This lack of an empirical foundation is recognized and these libraries are open to learning more about devising effective methods and measures. By setting goals and objectives and creating strategies for obtaining them, these libraries will improve virtual reference services and be prepared to handle growth without stress to staff or a drain on resources.

Intelligent planning and decision-making should be based on a foundation of empirical knowledge. Libraries need guidelines for measuring the usefulness, efficiency, effectiveness, and impact of digital reference services in order to implement them with the least amount of stress to their organizations and with the greatest possible benefit to users. Sufficient meaningful assessments currently do not exist. The Project's goal is to provide a viable set of guidelines for libraries that will fill this need for knowledge about digital reference services.

It must be noted that these site visits represent only one part of a larger picture afforded by this effort to develop standards of quality digital reference service and to equip libraries with the tools needed to evaluate and understand these services. In the next phase of this project, the data collected here will be used with understandings gained from the literature on digital reference, and with data provided to the Project team by librarians across the county through the "What's Your Story?" web site, for developing measures and quality standards for libraries of all types.

These measures will then be field-tested in a sample of participating libraries and fine tuned as necessary. The end product of this effort will be a practical manual of assessment techniques to produce measures and quality standards. The study phases and schedule are provided in Appendix I.

## APPENDIX I

### STUDY PHASES AND SCHEDULE

**Phase I: Project Organization and Communication with Advisory Committee and Study Participants. [Ongoing to March 02]** In this phase, the study team will develop detailed Project tasking; review existing work and resources related to evaluation of digital reference services and related topics; establish a Project Web site and list serves, and communicate progress on Project milestones on an ongoing basis with advisory committee and study participants.

**Phase II: Conceptual Development of Project and Preparation for Site Visits. [June 01 to July 01]** Members of the study team will conduct a selected number of case studies/site visits with participating libraries that are actively involved in digital reference service evaluation or that have staff especially knowledgeable in this area.

**Phase III: Tell Us Your Story. [June 01 to November 01]** Develop protocol for obtaining data, post instrument to web site, publicize effort, analyze data, and write report.

**Phase IV: Site Visits. [July 01 to October 01]** Schedule and perform site visits. Draft reports. Analyze and summarize site visits

**Phase V: Preparation for and Field Testing of Measures and Quality Standards. [June 01 to February 02]** Based on the existing knowledge base, case studies, and the study team's knowledge, a set of proposed measures and quality standards will be proposed. These will be field-tested in a sample of participating libraries.

**Phase VI: Final Report. [July 2001 -April 02]** The study team will produce a final report that will be a practical manual of assessment techniques to produce measures and quality standards for digital reference in libraries of all types.

These tasks and the Project schedule may be modified as the Project progresses.

Participating libraries will receive the manual at the end of Phase IV.

## APPENDIX II

### QUESTION GUIDELINES FOR SITE VISITS

#### I. Digital Reference Service

1. Library type: Academic, public, special (type), virtual library, etc.
2. Service model: Stand alone, consortium, network, etc.
3. Service type: Email, web form, chat, video conferencing, etc.
4. What are the library's objectives in providing digital reference service? Is there an evaluation plan in place (or defined) for measuring these objectives? Describe.
5. Was a needs assessment performed in preparation for providing this service? Describe.
6. Are there written policies/procedures for the digital reference service? Collect copies if formal documentation exists.
7. How visible is the digital reference service to the user? How easy to access? Where is it located on the library's web page? Top-level link?
8. How are users and potential users made aware of the digital reference service provided by this organization? How are these services publicized?

#### II. Digital Reference Process

1. Please describe how a reference question is answered electronically...walk us through a "day in the life of a question."

#### III. Digital Reference Desk Experience

1. How long has the library been providing digital reference service?
2. How many digital reference questions (per month, quarter, year) are currently being received and processed? Have there been changes in volume over the history of the service? If so, how has it changed?
3. What is the turnaround time for questions (per policy and actual experience)?
4. How do digital reference statistics compare with the traditional reference statistics being collected?
5. What method(s) of quality control are used to maintain service quality?
6. What percent of questions are answered? What percent are answered correctly? How do you know?
7. Are questions used to track trends, feed a Frequently Asked Questions (FAQs) page, inform collection development, and/or create auto responses to questions? Are they used in any other ways?
8. How many ways are questions received? Through web form only? Via email only? Through both web form and email? Through help desk? Through Chat? On-line reference software?
9. Are users limited to a certain amount of text space in which to ask their questions? Is there a length limit for answers? If so, what is the reason for this limitation?

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10. What kinds of questions are accepted at the digital reference desk (for instance ready reference and research)? Does digital reference include other services like ILL or photocopying; fax, snail mail, or email materials; referrals, etc.?
11. Is a reference interview a routine part of this service? When an interview is performed how is it done (synchronous/asynchronous)? What determines whether a reference interview is performed or not?
12. Is service multi-lingual? English only?
13. Does digital reference service include any kind of user training or orientation?
14. What resources are used to answer digital reference questions? Traditional and electronic? Electronic only? What types of electronic resources?

### IV. Digital Reference Desk Users

1. Who *may* use the library's digital reference desk services? Is there a target audience?
2. Is a password, account, library card, or other membership required? Are there any issues related to authentication?
3. Who *is* using the digital reference service? What do you know about who is using (and who is not using) this service? How do you know?
4. What response is given to non-affiliated users? Referral? Is service provided to non-affiliated users based on a different standard of quality (such as longer turnaround time)?
5. How are privacy issues dealt with? Is there a policy in place concerning privacy and digital reference services?
6. How is user satisfaction with digital reference services being measured?
7. Is information on user return rate collected? How many users are new users? How many are return visits?

### V. General Management of the Digital Reference Service

1. How is the library organized to provide digital reference service?
2. What kind of administrative support is needed to track questions, manage the reference question database, gather statistics, etc.?
3. Is there a separate budget line in place for the library's digital reference service?
4. Is there an evaluation plan in place to assess digital library services as a whole?

### VI. Digital Reference Service Staffing and Training

1. How are staff assignments to digital reference desk made? Special digital reference desk staff? Included as part of regular reference duties?
2. Were positions added when the digital reference service was added?
3. How are digital reference questions distributed to staff? Who receives them? Are questions distributed by the system or does a staff member distribute them?
4. What criteria are used to distribute questions? Are digital reference questions distributed by the system or by a person? Are questions assigned on the basis of expertise, by who is on "the desk," self-selected by staff, or some other way?
5. How many hours a day is the digital reference desk staffed?
6. Are service procedures formally documented?

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7. What training/skills are required to be a digital reference librarian at this library?
8. Has staff received any special training in, orientation to, or mentoring in digital reference skills?
9. How is staff performance of digital reference services measured and evaluated?

### **VII. Economic/Cost Issues**

1. How is the digital reference service supported/funded?
2. How are the costs of digital reference service being accounted for in the budgeting process? Service as a whole, cost per transaction? Is cost for service combined with traditional reference costs?
3. Do you know what it costs to answer a digital reference (and/or traditional reference) question? How is this calculated?
4. What is the effect of supporting digital reference on other library expenditures?
5. Have any measures of cost effectiveness been used? Please describe.
6. Has any cost/benefit analysis of the digital reference service been undertaken? Please describe.
7. Have any pricing structures (or cost recovery models) for this service been considered? Describe.

### **VIII. Technology**

1. What hardware/software is needed to support the library's digital reference service?
2. How satisfied is the library with the technology currently being used to provide digital reference service?
3. Are there any plans to upgrade or change the hardware/software currently being used to provide digital reference service?
4. What is the speed of the library's Internet connection?
5. What hardware/software does a user need to access this service?