

Texting 4 Answers

What Questions Do People Ask?

This study seeks to provide empirical evidence about how users use text reference service, especially what kinds of questions they ask, to further the professional understanding of this emerging reference service venue and how to best deliver text reference service via this venue. More than three thousand transactions from My Info Quest, the first nation-wide collaborative text reference service, were studied to identify the types of information needs fulfilled by text reference. Additional analysis of characteristics such as transaction length and interactivity provides a more in-depth picture of the nature of text reference. Findings of the study will be beneficial to libraries that are interested in starting a text reference service and developing best practices.

Today's technologies offer new ways for librarians and users to interact. One such technology that is growing increasingly popular as a communication venue is texting, or the exchange of text messages on mobile phones. These messages can be comprised of words, numbers, or alphanumeric combination. Each message can be up to 160 characters in length when Latin alphabets are used and 70 characters in length when non-Latin alphabets are used. Texting is becoming a popular communication venue in the United States and around

the world. The rapid growth of cell phone ownership in the past few years demonstrates the popularity of mobile technology. The Pew Internet & American Life Project shows that 77 percent of all adults had a cell phone or other mobile device in 2008 and that the number rose to 85 percent by April 2009; for teenagers ages 12–17, the same statistic increased from 45 percent in 2004 to 71 percent in early 2008.¹ In addition to the astounding expansion of cell phone ownership among teens, the mobile world has witnessed a growing trend in their use of texting, both in overall likelihood of use and in frequency of use. The percentage of teens (both cell phone owners and non-owners) that had sent a text message increased from 51 percent in 2006 to 58 percent in 2008, and the percentage that used text messaging daily increased from 27 percent to 38 percent over the same period.²

Indisputably, texting has become a significant avenue for communication and social activities in people's daily lives. Its growing popularity has drawn attention in the library community and libraries have started adopting it as a medium to offer reference services. Texting-based reference service, or text reference in short, is defined as reference service provided via the exchange

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Reference & User Services Quarterly, vol. 51, no. 2, pp. 43–52
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of text messages on mobile phones. To use the service, library patrons send their questions as text messages to a phone number and receive answers in the same format. Librarians usually use a web application like e-mail to receive and respond to patrons' questions.

Due to the emerging nature of text reference service, empirical research is much needed to study the affordance of texting as a means for reference service and to understand how patrons use this service to meet their information needs. The types of information needs are usually indicated by the types of questions people ask. Therefore, this study seeks to perform an in-depth analysis of text reference inquiries and hence identify the types of information needs fulfilled by the service. The main research question in this study is "What are the types of questions people ask when using a text reference service?" In addition, the study will explore other variables concerning text reference questions and answers, such as the level of interactivity in transactions, question completion status, initial response time, repeat service use, and more. This study will present a comprehensive view of how text reference service assists patrons in their information seeking process and thus help library professionals better understand and use this avenue to deliver reference services to patrons.

The study was conducted in the context of My Info Quest, the first collaborative text reference service in the country. My Info Quest was launched on July 20, 2009, and as of December 2010, it offers service (central time) from 8 a.m. to 11 p.m. Monday through Thursday, 8 a.m. to 6 p.m. Friday, 9 a.m. to 6 p.m. Saturday, and 1 to 6 p.m. Sunday. It uses Altarama SMS Reference as the gateway software. This software redirects questions to a Gmail account, where librarians read them and compose the answers. Each reference answer is limited to two text messages (320 characters) and any text beyond that will be truncated and not be viewed by patrons. By the time of the study, My Info Quest had 64 participants from all over the country, including 29 academic libraries, 20 public libraries, 9 volunteering individuals, 4 regional library organizations, and 2 school libraries.

LITERATURE REVIEW

Question Typologies

Reference literature abounds with studies that examine question categorization. In reviewing the literature, two major typologies emerge.

William Katz's *Introduction to Reference Work*, now in its 8th edition, is generally considered the standard textbook in reference and information services, popular among generations of library and information science students.³ Its influence becomes clear as one examines the literature; his categorization of questions is cited in much of the reference service evaluation research.⁴ Katz's model divides questions into four broad categories: directional, ready reference, specific search, and research.⁵ Perhaps Katz is so widely used not only because his textbook provides an introduction to

reference for so many students, but because his taxonomy also works as a jumping off point. Many researchers reference his model in their own analysis of reference questions, describing traditional categories and then altering or building on them as specific needs dictate.⁶

In 2001, Debra Warner's library switched to a single point of service and sought to reexamine how statistics were tracked for library functions.⁷ The library used Katz's model to classify questions, and there was a lack of cohesion between staff members as to how to use the categories. Warner's analysis was that "because of the confusion about the definitions being used, the statistics generated did not adequately reflect what happened at the service desk."⁸ Building on the work of Calabretta and Ross, her system of classification also has four main categories, but addresses the librarian's response rather than solely categorizing the question.⁹ Her categories are nonresource-based (do not require a resource to answer, e.g., geographic or policy questions), skill-based (questions that require a demonstration), strategy-based (questions that require the formulation of a plan to locate and select resources), and consultation (longer encounters that may require research outside of the meeting). In 2008 at the University of South Florida, St. Petersburg, Henry and Neville tested Katz's and Warner's models, concluding that the "Warner classification system may be a reasonable and more realistic alternative to the traditional reference categories required by the national reporting agencies."¹⁰ Meserve et al. also test the application of Warner's model, finding success at San Jose's King library.¹¹ Warner's model is emerging to challenge Katz's tradition, as more and more librarians have begun to critique, use, and adjust her work for the purposes of their own research.¹²

Katz and Warner are perhaps the most widely accepted models on either side of the divide between question-based and response-based classifications. They offer the foundation for other researchers to develop their own question typologies.

Text Reference Service

The current literature on text reference service primarily consists of reports of individual libraries' experiences of establishing a text reference service. The focus of these reports is service implementation, such as service delivery tools, budgeting, staffing, service promotion, service hours, and volume of usage, while the examination of question types is mostly a brief component in these reports and presented in a rather cursory manner. Hill et al. mention that the majority of questions are of the short-answer variety and relate to the library or the university; Giles and Grey-Smith report that the majority of questions require a simple explanation and can be answered in one text message; Kohl and Keating state that most questions are academic or ready reference questions and there are intermittent joke questions too; Wiemer finds that circulation questions, ready reference questions and database access questions are the three types of question that rank highest in number; Stahr summarizes that 86 percent of the questions are library reference questions with varying

complexity, splitting between regular reference questions and questions concerning different aspects of library services such as library hours, circulation, behavior complaints, database, and remote access; Cole and Krkoska discover that about half of the questions are quick questions that only need a brief factual answer, and another half are substantive questions related to course assignments, research, or resources.¹³

So far there has been one published study dedicated to the analysis of text reference transactions. In this study, Pearce et al. focus on a number of transactional variables.¹⁴ They report an average of 3.79 messages in each transaction, and find that transactions dealing with reference questions tend to be lengthier than others.¹⁵ About 61 percent of the lengthier transactions receive a thank you note from patrons.¹⁶ In terms of the timeliness of response, an average of 140.23 minutes elapses before a question gets answered during service hours.¹⁷ As for question types, they only use two broad categories to characterize the questions—reference and directional, and find that 40 percent of the total questions are ready reference questions.¹⁸

Overall, the literature seems to indicate that the majority of text reference questions are short reference questions and questions about library collections and services. However, as stated earlier, the coverage of question analysis is minimal and in most studies there is no detailed description of the method and no clear definition of the unit of analysis (e.g., what constitutes a text reference transaction or question). Furthermore, all of the studies containing the examination of question types are set in an individual academic library and no other library environments have been explored. To fill in the blank in the literature, this study seeks to conduct a systematic and in-depth analysis of text reference questions in a collaborative text reference environment, and hopes to provide a thorough look of the types of questions that patrons ask and to develop a better understanding of how patrons are using text reference service to fulfill their information needs.

METHOD

Like e-mail and chat reference service, text reference service is provided digitally and all the transactions can be captured by the software that supports the service. At the time of the study, My Info Quest was using Alta Rama SMS Reference as the gateway software to connect patrons' text messages with a Gmail account, and librarians were receiving and answering questions via e-mail. Therefore, all the text reference questions and answers were recorded and stored in the e-mail account.

My Info Quest was launched in late July 2009. By the time of the data collection, the service had been running for twelve months. Transcripts from each month were considered a monthly cluster, making twelve clusters in the study population. Systematic random sampling was employed to select four clusters as the study sample, which ended up consisting of 3,103 questions. Both quantitative and qualitative content analysis was conducted on the sampled questions. The results

are presented in the following section. In this paper, transcriptions of text reference questions are entered verbatim, without attempt to correct spelling or grammar.

RESULTS

The unit of analysis in this study was an independent question in a text reference transaction that represented a distinct information need. A follow-up question asked to provide clarification was not considered an independent question. For example, a patron asked an initial question about the new health care bill—"I was curious as to what are the details and terms of the new health care bill," and then sent a follow-up question "does the new health care bill require all Americans to have health insurance and if not there will be a penalty" to further specify his or her information need. In this transaction, the follow-up question does not represent a new information need; it functions as an attempt to better specify the original need. Therefore, it is not considered an independent question.

Question Types

The text reference questions were coded using a scheme developed from Katz's reference typology, which was chosen over Warner's model because it is question-based and meets the needs of the study.¹⁹ The study intends to examine the questions asked by patrons as an indicator of their information needs, and therefore the question-based typology proposed by Katz is a more appropriate foundation on which to build question categories for analysis. Table 1 presents the question distribution across the different categories. The majority of the questions appeared to be ready reference questions.

Local Library Related

All the questions related to patrons' local libraries were grouped under this category. Although My Info Quest is a

Table 1. Breakdown of Question-Type Distribution

Question Category	%
Clearly Worded Questions	
Local Library Related	13.3
Nonlocal Library Related	
Ready Reference	69.8
Specific-search	9.2
Personal Knowledge Related	1.3
About My InfoQuest	2.4
Out of Service Scope	1.5
Unclear Questions	2.5

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text reference service with participation by more than sixty libraries in the nation, patrons are not necessarily aware of the collaborative nature of the service. They assume they are interacting with a local librarian and hence ask questions related to aspects of their local libraries.

Local library related questions can be further broken down into the following categories:

- About a known item. Some patrons sought to locate a known item in their local libraries. A known item is a specific document (book, article, film, etc.) that can be identified by citing certain features like author or title.²⁰ For example,
“do you have the 10-cent plague? It’s a history book about depression-era America banning comic books.”
- About library resources. Some patrons inquired about whether their local libraries had certain resources, and some others inquired about how to use certain library resources. For example,
“How would I be able to do a computer search through magazines for a topic I need to write a long essay on?”
- About library policy and procedures. Some patrons were in search of information related to their local libraries’ policy and procedures. For instance,
“I would like an appt. to learn how to do a lit search for my research project for my msn program. How can I arrange this?”
- About library services. Some patrons needed information about the various kinds of services provided at their local libraries. Library services may include book sales, reference services and computer literacy instruction. For example,
“where is the Orinda library book sale being held today?”

Ready Reference

Ready reference questions are defined as questions that require a single and straightforward answer, consisting of a specific and definitive piece of information. This type of questions can be divided in many different ways and across almost all subject areas.²¹ In this study, the subcategories of ready reference questions are established based on the nature of the information sought by the questions.

- Descriptive or explanatory information about events/phenomena/entities/concepts/processes. For example,
“What is the airspeed velocity of an unladen european swallow?”
“Do squirrels hibernate?”
“What r the chronic medical conditions which qualify a 59 year old for the h1n1 vaccination?”
- Factual or statistical information about a historical or contemporary topic. Such information is usually simple

facts and numbers. For example,

- “Who won the 1955 superbowl?”
- “Lottery Results For Illinois on October 13th, 2009”
- “what percent of us citizens have passports? Thx”
- Information about people, including celebrities, athletes, scientists, literary figures and more. For example,
“who is callie Koziel”
“what hockey team does sean avery currently play for?”
“Where or how can I contact Johnny Depp about important issues?”
- Information about places/addresses, including directions, location, contacts and other information about a particular place. For example,
“How do i get from the intersection austin st and pecan st to 1634 chestnut st in denton, TX?”
“What is the phone number for comcast?”
“what’s the closest corn maze/haunted corn maze to the city of portland oregon”
- Information about languages, including definitions of words, translation between languages, and other linguistically related information. For example,
“what is the plurl for church?”
“wut does comme d’habitude mean in French”
“Please translate this in english. This is in japanese. Ringo wa skideska”
- Weather information. For example,
“what is the weather forecast for portland, oregon?”
“Will it rain constantly in Peoria illinois today or will it let up?”
- Culinary information. For example,
“if you put sickerdoodle cookie dough in the fridge for an hr. will that make them soft cookies when u bake them”
“What is the recipe for coca cola cake?”

Specific-Search

Unlike ready reference questions, specific-search questions are not answered with a particular piece of information. When handling this type of question, librarians provide information sources (e.g. websites, books, periodicals or referrals) for patrons to review, synthesize, and ultimately conclude how to formulate their own answers.

Some of the medical or health-related questions fall under this category. These questions cannot be answered with well-established facts or generally known information. The answers usually depend on a number of variables such as personal medical history and personal beliefs, and hence require professional medical expertise. For example,

- “Can strep throat medicine be taken for a UTI?”
- “Are lilacs toxic to eat?”

Some questions require a comprehensive answer that would be difficult to present in a short and straightforward manner. Thus, directing patrons to specific information

sources seems a more reasonable approach to fulfill their information needs. For example,

“WhY are Redheads Fiery?”
 “Why are arguments against stem cell research?”
 “How did the gaurds of the soviet union prison camps’ experience differ from that of the prisoners?”

Readers’ advisory questions are also considered as specific-search questions.²² Basically, patrons are asking what the best source is for their information needs. This “source” may be reading materials, as in a typical readers’ advisory question, or any other kind of information source. For example,

“Can you recommend a book or article my 10 year old son can read about taking responsibility in school or becoming a better student?”
 “Where can I find the best online database of baseball statistics?”
 “Where can i download adult games 4 my phone 4 free”

Finally, some questions simply do not have an agreed-upon and definitive answer. Such questions are usually answered with information based on theories, philosophies, opinions and suggestions. Thus answers to these questions can be subjective. When provided with information sources, patrons can examine them and determine how to best answer their questions with information from these sources. For example,

“If a tree falls in the woods and no one is around to hear it does it still make a sound”
 “Why are so manny players in the world”
 “What are some suggestions for funny fake names?”

Personal Knowledge Related

Questions under this category refer to those that require librarians’ personal knowledge to answer. These questions are usually word puzzles or mathematical problems. However, librarians do not necessarily possess the knowledge to answer all of these questions. For example,

“ms.choo is replacing the floor in her kitchen.the plans for her house use a scale factor in which 1/5 inch equals 1 foot. if the plans tht her kitchen is 2 inches by 2.5 inches wht are the actual dimensions of the room
 Do you know how to find the last term in the pattern?2 36 18 68 48 48 32 32 3 _”
 “WHAT ENGLISH WORDS OF 4 OR MORE LETTERS CAN B MADE FROM THESE LETTERS: C I M O C O I R E S”

About My Info Quest

Questions specifically seeking information about the service provided by My Info Quest are grouped under this category.

Some of the questions were asked by curious patrons, for example,

“Are you a computer, or a human?”
 “Do you guys send pictures?”
 “does it cost me anything to use this program if i have unlimeted text”

And some were asked by library colleagues who would like to know more about the service, for example,

“How can a library participate in this service”
 “Can you tell me about your service? I am a reference librarian and am interested in providing such a service to our patrons.”

Out of Service Scope

Not all questions received by My Info Quest are reference questions. Some of them fall out of the service scope and cannot be answered with specific information or information sources. A few patterns are identified for these out of scope questions.

- Occasional spam messages. For example,
 “FREE T-Mobile Msg: Refill your T-Mobile account at any US MoneyGram location. Give the agent receive code 7272. Pay in cash with no additional fees.”
- Inquiries about on-duty librarian’s personal life and personal information. It is likely that some patrons are just bored and want to chat with someone via texting. For example,
 “HIII! how is your fine evening going may i ask?”
 “Is your name Tanner?”
 “R u an fbi agent?”
- Questions seeking on-duty librarian’s personal opinions. For example,
 “Who do you think would win in a fight between a hotdog and a taco?”
 “hey im sick with a cough and a fever do u think ill be able to go to schol by Monday. Thankss”
 “Tell me what you think about having a baby with a man you could care less about”
- Questions that are impossible or unethical to answer. For example,
 “What color is my hair?”
 “Wats a good excuse to tell your parent about your not going to skool?”

Some of the out-of-scope questions can be simply ignored, such as the spam messages, but some others can still be answered. For instance, for patrons’ personal inquiries, librarians can send back a polite reminder of what the service is about and what kinds of questions are answered by the service, and encourage patrons to use the service more

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properly. For questions seeking opinions from them, librarians can also direct patrons to information sources about the topic in question.

Unclear Questions

Unclear questions are defined as messages that are worded unclearly or ambiguously, and are difficult for librarians to interpret. Such questions usually need to be rephrased and clarified for librarians to gain a clear understanding of them. It is likely that some of the questions are either test messages to try out the service, or mistakenly sent to My Info Quest. For example,

“What did the Green grape say to the purple grape?”
“Runng late”
“Did you break the board”

Question Completion

There are three completion statuses for each question—answered, unanswered, unfinished. When a question is answered, it means that librarians have provided information/sources/referrals to answer this question. The majority (93 percent) of the questions were answered.

The “unanswered” status is assigned to questions that did not receive any response from librarians. A small portion (2.7 percent) of the questions went unanswered. Some of the unanswered questions were unclear or out of the service scope, some others were simply regular reference questions.

“Unfinished” questions lie somewhere in the middle. A question is unfinished mostly because patrons did not respond to librarians’ clarifying questions. In a few occasions, librarians did not respond to patrons’ follow-up messages, which also made a question “unfinished.” About 4.3 percent of the questions were considered unfinished. Here are two examples of unfinished questions:

Patron “how do I receive my account info to log in from my phone?”
Librarian “Which account or service are you trying to log into?”

Patron “Hi is the library open today”

Librarian “All our libraries were closed July 4. Do you need July 5 hours?”

Patron “Yes please”

Initial Response Time

Initial response time is defined as the length of time it takes for librarians to respond to patrons’ questions. It is calculated as the time difference between the patron’s question and the librarian’s first response. The majority of the questions (58.3 percent) were responded to within ten minutes, as shown in table 2.

As for the 18.6 percent of the questions that took more than an hour to receive a response, most were asked during the hours when the service was closed. An automatic message was sent to patrons if their questions came in during off hours, which explained to them that the service was currently closed and their questions would be answered as soon as it opened again.

Interactivity in Transaction

The number of messages in each transaction is an indicator of the degree of interactivity between the patron and the librarian. As indicated in table 3, among the 3,018 completed or partially completed transactions, most (74.5 percent) consisted of only two messages, one from the patron and one from the librarian. The high proportion of such transactions suggests that text reference transactions tend to be simple and short.

Frequency Distribution by Day and Time

Although My Info Quest service is not provided 24/7, patrons can submit their questions at any time. Figure 1 shows that most of the questions were received between 8 am and 7 pm PST, during the service hours.

In terms of the question distribution by day of week, the number peaked around Wednesday and Thursday, although the difference is not dramatically significant between the peak days and the rest of the week, as shown in figure 2.

Table 2. Initial Response Time

	Fewer than 5 Minutes	6–10 Minutes	11–30 Minutes	31 Minutes to 1 Hour	More than 1 Hour
Initial Response Time (%)	34.3	24.0	18.0	5.2	18.6

Table 3. Number of Messages Contained in Each Transaction.

	2 Messages	3–5 Messages	6 or More Messages
Number of Messages Contained in Each Transaction (%)	74.5	21.1	4.4

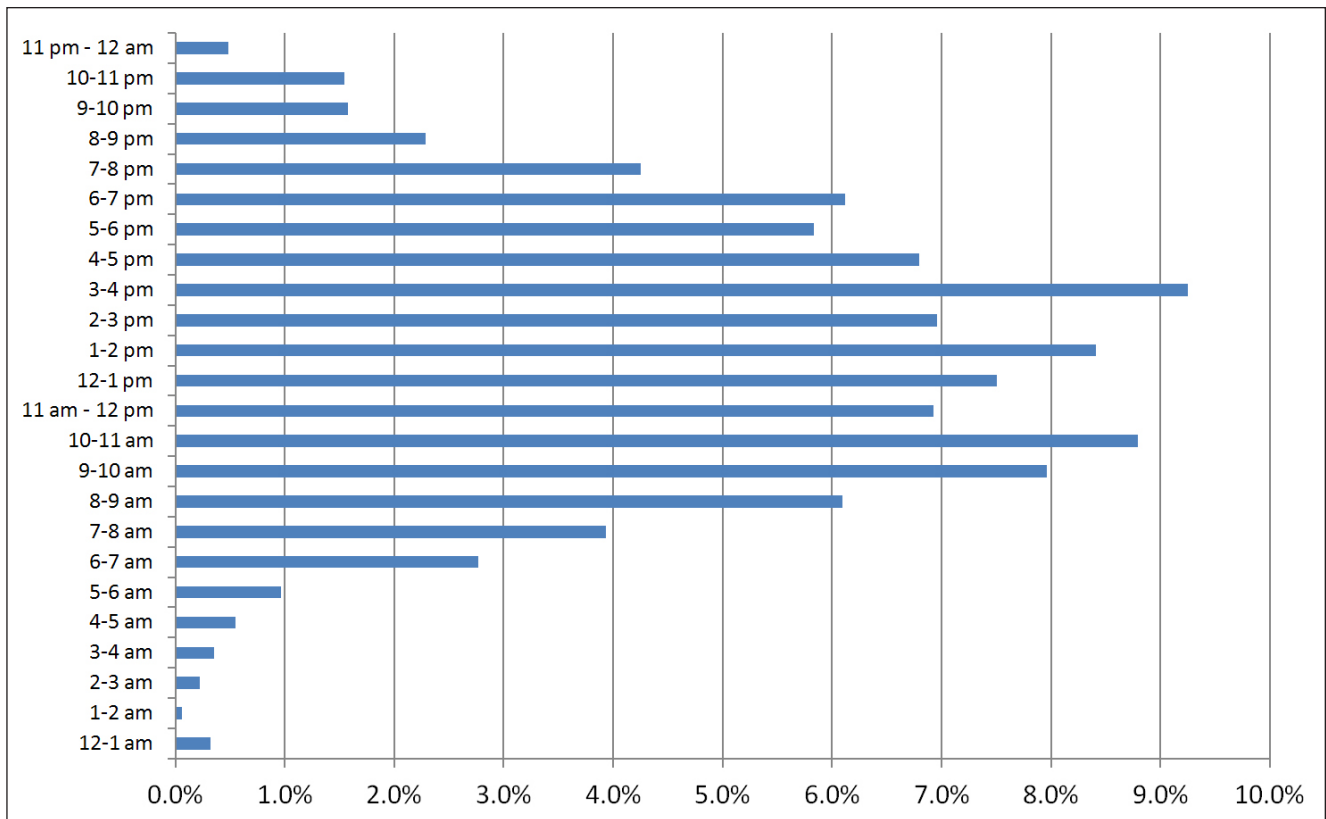


Figure 1. Question Distribution by Time of Day

Repeat Users

A total of 3,103 questions came from 988 cell phone numbers, among which 62.8 percent were one-time users of the service, and 37.2 percent were repeat users who used the service more than once.

As table 4 suggests, among the 368 repeat users, the majority (71.5 percent) used the service 2 to 5 times. Surprisingly, close to 1 percent of the users used the service more than 50 times. The most frequent user even used the service 192 times in the sampled four months.

However, when patrons used the service multiple times, they did not necessarily ask a new question every time. Occasionally they asked the same question more than once. Such repeat questions occur primarily in two scenarios. First, after patrons sent in the initial question, they did not receive any response for a while, and then they sent in the same or slightly reworded question again. It is likely they thought their question was not received or not clear enough the first time it was sent, and hence texted the question again. Second, patrons sent in the same or slightly reworded question again even after a response was provided by librarians. It is likely that they did not receive the response

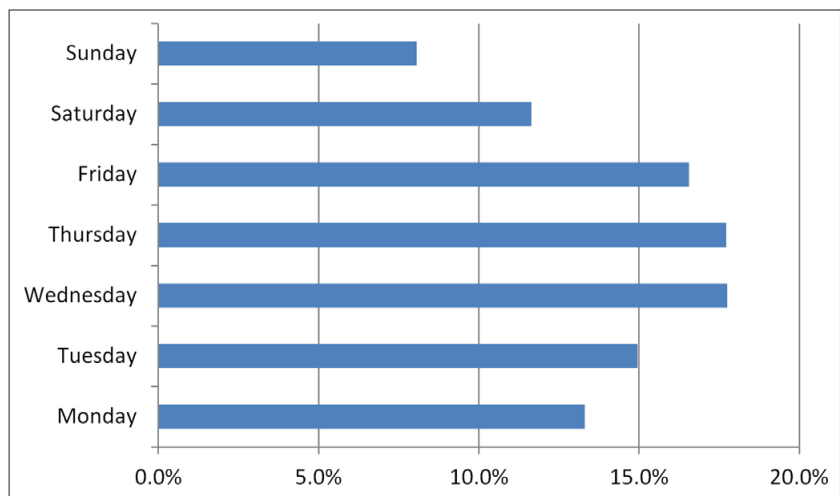


Figure 2. Question distribution by day of week.

because of technical reasons, or they were not satisfied with the previously received response.

Duplicate Answers

Not only did patrons ask the same question repeatedly, there also were instances where librarians provided duplicate answers to the same question, as shown in the two examples

Table 4. Repeat Users.

	2–5 Times	6–10 Times	11–20 Times	More Than 50 Times
Repeat Users (%)	71.5	14.7	13.0	0.8

below. It seems that the duplicate answers came from different librarians. Some of them were consistent, and some others were not. One possible explanation for this phenomenon is that as one service shift transitions to another, the two librarians covering both shifts have an overlapping presence and both attempt to answer the questions that come in during the transitional period.

Patron: “im looking 4 the dvd max pain do u have it”

Librarian: “Max Payne (DVD) is not available through SPL (Sacramento Public Library). Thanks for choosing MyInfo Quest!”

Librarian: “I do not see the Sacramento Library having “Max Payne” in their collection. Sorry!”

Patron: “why does my body jolt as i fall asleep?”

Librarian: “That’s called hypnic jerk. Wikipedia has an article about it.

http://en.wikipedia.org/wiki/Hypnic_jerk”

Librarian: “There are many different reasons that your body might jolt as you are falling asleep. I would recommend consulting a doctor on this matter.”

Teen Patrons

A multitude of the questions appear to have come from teen library patrons. Such questions usually have one of the four following characteristics.

Teen Interests

Pop culture topics such as celebrities, relationships, sex, drugs, video games and part-time jobs are likely to be of interest to teens. Many questions fall under this topical range. For example,

“How can i tell if my boyfriend is the one im going to spend my life with?”

“Is talor swift dating taylor laughtner”

“Is twilight doin castin calls?”

“why do girls have mood swings?”

“Wat is money cheatcode for atv offroad fury4 on playstation2”

“How old do you have to be to apply for a job?”

School-Related

It is reasonable to assume that school-related questions were asked by teens because this is a topic that greatly concerns them. However, as indicated in the examples below, most of

the school-related questions appear to be questions about homework.

“Y is a 4 year college better then a 2 year college?”

“2x + 6 = 3x - 11 What’s the value of x?”

“What are the types of organisms that use photosynthesis to produce glucose.”

“I need to find the verb in this sentence and identify if it is transitive or intransitive: People call New Mexico the Land of Enchantment.”

Self-Identified

Some young patrons disclosed their age while asking questions, hence self-identifying themselves as teen patrons.

DISCUSSION AND CONCLUSION

As an emerging venue for reference service, texting is rapidly gaining popularity among library users. Within one year of its launch, My Info Quest text reference service has averaged more than 750 questions per month. The fact that close to 40 percent of the patrons were repeat users is also strong indication of its high user retention rate. Such popularity may be attributable to the wide use of cell phones and the convenience of texting as a communication channel. However, the limit of 160 characters per message restricts the amount of information conveyed via texting. Therefore, as the study shows, most patrons use text reference for ready reference questions, whose answers are usually brief and straightforward. This finding is consistent with what has been reported in the literature—text reference questions are of the short-answer variety. Since this type of questions seeks a specific piece of information, they are mostly unambiguous and do not involve a comprehensive reference interview. In this study, almost three quarters of the transactions contain only two messages and more than 95 percent contain five messages or less.

Given patrons’ obvious inclination to use text reference for ready reference questions, text reference librarians should be familiar with reference and information sources on the web and how to effectively search and locate information within them. While the majority of ready reference questions take just a few minutes to answer, some of them may take hours of research.²³ This is attested to by findings of this study where only close to 60 percent of the questions were responded to within 10 minutes. As for the rest of the questions, some were submitted during service off hours, and some others could simply be too difficult to answer in a few minutes. When encountering such difficult questions, it is important that

librarians have a repertoire of strategies they can resort to to handle the questions as efficiently and effectively as possible. For example, as soon as patron's question is determined to be unanswerable within the promised response time, the librarian may immediately send a message notifying the patron that it might take longer than expected to receive the answer, or may offer the option to e-mail patron the answer if there are other questions in queue. A solid knowledge base of web information sources and a network of colleagues to seek help from are critical in handling text reference questions. Thus, an easily accessible cheat sheet containing useful sources on the web and information on how to consult colleagues will be of help to librarians providing text reference service. For instance, such a cheat sheet may include links to library policy/procedures, frequently used reference resources on the web (both general and subject-specific reference sources), a list of texting lingo, and tools like URL shortener or a character counter that could help librarians compose their messages concisely.

When answering text reference questions, it is important to be aware that not all cell phone users have mobile web, and that these patrons most likely choose to use the text reference service because of that lack. Therefore, it is best to answer the questions with specific information rather than by simply pointing patrons to a web source. Admittedly, sometimes the information needed for ready reference questions can be too long to fit in one or two messages (e.g. lyrics, recipes), or too difficult to find (e.g., "how many states allow the use of tasers on juveniles?"). However, unless it is absolutely necessary, it is preferable to compose the answer with information rather than with URL(s). For instance, lyrics and recipes can be written in short texting lingo and sent in separate text messages. If patrons do not have unlimited texting or libraries use a vendor that charges per message sent, the cost of texting can be a concern. In that case, librarians can lead with a URL referral and offer patrons the option of receiving the answer in multiple texts.

For specific-search questions, there is usually not a definitive answer. Still, an informational summary can be helpful when provided along with the sources. For example, when answering the question "what is the easiest way I can build up my arms and legs?" in addition to recommending that the patron talk to a doctor and pointing him/her to authoritative health sources, it would be useful to offer a brief summary of the muscle building techniques from the sources. An exemplar answer (272 characters in two texts) may be "eat quality foods—40 percent protein, 40 percent carbs, and 20 percent fat, use core and compound exercises in training like deadlift, squats, bench press, overhead press, rows, dips, pullups, get enough rest and drink plenty of water. From <http://bit.ly/ea0Ky0>. Best to consult your doctor." It is helpful for patrons, especially those without access to mobile web, to get an immediate preliminary answer before they investigate the recommended sources to answer the question themselves. When it is unavoidable to refer patrons solely to a source, it is valuable to provide a phone number along with a URL (e.g.,

when referring a patron to an organization, provide both the phone number and the organization website) to accommodate the needs of those without mobile web. Basically, text reference librarians have to strike a good balance between being concise and being informative.

My Info Quest is a collaborative text reference service with participation by libraries of different types. Participating librarians take turns to cover the service and the user community consists of patrons of all member libraries. As indicated in the study, more than 13 percent of the questions were related to resources, services and policies at patrons' local libraries, and therefore, it is crucial for librarians to be familiar with member libraries' websites so that they can better help their patrons. Luo, in studying chat reference service competencies, determined that knowledge of other participating libraries' resources in a collaborative chat reference project is one of the twenty-one essential competencies for chat reference librarians.²⁴ This conclusion also applies to collaborative text reference services where librarians answer questions not only from their local patrons, but also patrons of all the other member libraries.

As shown in this study, a small portion of the questions were found to be unclearly worded, out of service scope, incompletely answered, or repeatedly submitted. Varying practices may emerge if there is no clear policy in place to steer librarians on how to answer these questions. For example, some librarians simply ignore the questions that seem unclear, while others send patrons a message asking for clarification. As for out-of-service-scope questions, it is important to not only define what the service scope is and what constitutes an out-of-scope question, but also to clearly lay out the guidelines for answering such questions. Without the guidance of service policies and procedures, it is impossible to ensure consistent service quality. This leads to negative experiences by patrons. Therefore, when setting up a text reference service, it is vital to consider the different kinds of patron questions and establish clear policies to guide the question-answering practice.

One of the observations in the study was that sometimes questions were given duplicate answers. This is likely to be caused by two librarians covering two sequential shifts and attempting to answer questions submitted during the shift transition period. As mentioned earlier, text reference questions were received and answered via Gmail. Thus, there is no mechanism for librarians to claim questions and avoid duplicate answers. Recently My Info Quest librarians contrived a remedy for this problem. When a librarian logs into Gmail for their shift, they send a message to Gmail announcing that they are ready to take over the shift; thus, the librarian from the previous shift will be alerted and hence reduce the likelihood of double answered questions. As text reference service becomes more popular, more research should be conducted on the usability of text reference software so that librarians' needs such as claiming questions can be met by properly designed software and text reference service can be delivered via a more efficient and powerful vehicle.

As the primary group of texting users, teens seem to be a major demographic among text reference users. Among the questions they ask, some are sex related. However, sometimes it can be difficult to tell whether teen patrons are genuinely interested in knowing the answers or are simply abusing the service by sending prank questions. At My Info Quest, librarians are encouraged to treat such questions as legitimate questions and assume that patrons are actually curious about them. Since such questions most likely come from teens, labeling them as inappropriate and refusing to answer them may create, if not reinforce, the rigid image of libraries in teen patrons' minds, and discourage those with genuine interests from using the service. Given the popularity of texting as a communication venue among teen patrons, libraries should actively explore the potential of text reference service to attract teen patrons and to help them improve their information literacy. Meanwhile, more research is needed to study teen patrons' perception and use of text reference service to develop a solid understanding of how to best assist them via the text reference avenue.

In conclusion, the main research question "what are the types of questions people ask when using a text reference service?" has been fully answered. The detailed question analysis presented in the study depicts the various types of information needs fulfilled by text reference service, and helps library professionals better recognize how patrons use text reference service to facilitate their information seeking process. Findings from the study will be beneficial to libraries that are interested in starting a text reference service. It is the authors' hope that this study furthers the professional understanding of texting as a reference avenue and attracts more empirical research to examine text reference service from other angles such as software usability, text reference answers, user experience/satisfaction, comparison between different library environments and librarian preparation.

ACKNOWLEDGEMENT

The authors wish to thank the Institute of Museum and Library Services for supporting this study.

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