Chapter 4
Technology

Now we'll get down to it. I imagine for a lot of people this may be what they're looking for out of this book. A few of you might even have turned to this chapter first, which I can certainly understand (though you've missed some good stuff—go back and read the rest some time!). None of this is all that surprising, because so much of the recent discussion about reference work focuses on technological issues. What kind of software do you use? Have you heard about a good use of chat? Isn't everybody going to 24-hour service? And so on. Those are the kinds of questions people ask at workshops and conference sessions and on the listservs I read, and when putting together such a service, these are important questions to ask.

But they're not the only questions, as I've already discussed, and should not, of course, be the first or driving ones. I think it all boils down to this: the real question librarians are asking is, "What should I do?" I was going to save this until the end of the chapter, but I think it makes more sense here: there is no single, definitive answer to that question. The technological environment in question is far too volatile, and different institutions and communities will have very different needs and desires for a single, one-size-fits-all solution, despite what vendors will tell you. We've been through this before, when we converted from card catalogs to the digital kind, and then converted again, and again. Often, though, the technical services side of the house largely drove those discussions. Now the shoe is on the other foot, and it's the public services people who are trying to think about what how most appropriately to fold technology into what they do on a daily basis.

In this chapter, then, what I'd like to do is walk through a few major technological options for reference work, think about what it is we really might want out of any technology, raise a few more issues specifically in the techno realm, and then finish up with some discussion of questions in a technologically-mediated reference encounter.

As we being thinking about this newest set of technologies to become part of reference work, it's worth reflecting one more time on the grand tradition to which they belong. Reference librarians have had a long history of using and adopting new technologies to help them in their work, from telephone and teletype based services in the previous century, through a variety of mechanical or automated systems (manual co-occurrence indexes, CD-ROMs, early Internet work with Archie, Gopher, and so on.) By its very nature, reference work implies facility with technology; reference librarians have always made sure that their work went beyond that to fluency and innovation, and it's exciting to watch and be part of them doing it again.

Options

We've previously—although briefly—discussed some of the technological options which currently present themselves for reference work. Here we will consider them in more depth, looking at their advantages and disadvantages, mentioning some specific examples and features, and concluding with a notion of what the best kind of options would offer.

Note, however, that I'm **not** going to spend a whole lot of time on specific systems or software. It's always risky to do that in any book that intends to have any shelf life at all; it's particularly perilous here, because this is such an emerging market, and many new players may enter in the not-so-distant future. To keep all of this from becoming obsolete the day after the manuscript is submitted, I'll focus instead on general features and thoughts, which will be less immediately valuable as a buyer's guide, but, I hope, of more use in the longer run.

New Technological Options for Reference

> electronic mail
> Web forms
> chat and instant messaging
> videoconferencing
> call-center based software

The first, and simplest technology to consider is **electronic mail**. This is how it all started, really, with a few librarians realizing this was a good way to communicate not only with colleagues and vendors but also patrons. In some cases, the patrons were there first, sending email to any address they could find on a library web site or bookmark, using it as a way to ask for assistance. In the very very beginning, this could be difficult, because for many libraries, email was hard to come by. Since the free email services such as Hotmail and Yahoo mail have started, though, this has become a non-issue, and there are very few libraries and librarians left without some sort of email available to them.

Email has some definite advantages as a reference tool. In addition to being easy to use and understand, it's the lowest common denominator. Not only is it possible to assume that almost every librarian has access to email, it's also possible to assume that many—but significantly, not all— potential inquirers do as well. I've seen a couple of libraries with email-based systems link directly to Hotmail or Yahoo Mail, suggesting that people set up free email accounts to be able to use the service—a simple but effective idea. In general, an email-based service is cheap (at least technologically speaking) to build and maintain.

Since email traffic leaves traces, it's possible to keep copies of what was received and sent. These can be used to evaluate the kinds of questions received and how they're phrased, time taken to respond to questions, the quality and accuracy of the responses, and so on. It's also possible to use email to send not only answers or brief quotations of print or digital materials, but also to send files, which might include documents, the results of searches, URLs of interest, and so on. As we discussed in Chapter 2, the asynchronous nature of email also provides that extra time to tackle difficult or challenging questions, compose responses in a thoughtful way, and take just a step away from the immediacy of the face-to-face reference encounter. It is also possible, of course, to use email to respond to a question which is posed in person or over the phone; this can often be good for those same deeper questions, and might yield substantially better responses for those people willing to wait a little while for a higher-quality answer.

However, I've always thought that email provided a very thin connection, especially for an infrequent or inexperienced user or one who is unfamiliar with the library. There are none of the social conventions of the face-to-face encounter, so it's possible to send a question, and then when asked for clarification, never to respond, leaving the librarian to wonder what happened. Many people rightly point out that it's very difficult to conduct what we think of as a good reference interview strictly via email, and the time lag in having any sort of multi-part communication can mean an answer to a simple question requiring clarification or refinement may take days. One more thing—if you're going to use email, you have to be able to type, have access to a computer, be able to write and read, all of which may be obstacles to some potential users.

The close cousin to strictly email-based services is the use of **Web forms**. Largely, this is for the intake of questions; while it would be technologically possible to use the Web in responding (by, say, giving questioners a code number to enter into a web form to get access to a response), the usual paradigm is a Web form to solicit the question and then email to respond.

This use of the Web then shares most of the advantages and disadvantages of email-based services. It does require access to a Web server, of course, which is more difficult and costly than simply using free email accounts, and also means somebody's got to run the Web server, maintain it, keep the pages fresh, check for broken links, and all the other required and necessary technical stuff. It also extends the reach of the service, meaning that more people can find it (assuming it's not impossible to find, being buried under several layers of Web pages). I've also already made my case about the effectiveness of Web forms as "interview" devices, so I'll spare you that again, but it's worth reiterating here that there is likely a sector of any library's community of service that would prefer this mode of communicating with library staff for some information needs, and as such, may well be a important part of most if not almost all reference services.

Many libraries and librarians have been experimenting with **chat and instant messaging (IM)** technology. While these aren't the same, strictly speaking, they're close, so we'll discuss them together. There are a number of options here, from ICQ and instant messaging tools from AOL and Yahoo and MSN to a wide variety of chat applications. Some are very simple, Web-based tools that allow for quick communication, others are much more fully featured, allowing for customization and personalization, capture of transcripts, pushing of Web pages, and so on. All of these are similar, though, in that they are designed for back-and-forth synchronous conversations, via typing of text, between two or more people. Some of the more advanced are also integrating voice and even video via webcam into chat or IM sessions.

The use of this software has some intriguing potential advantages. They are relatively simple to use and have a large installed base, especially in some organizations and among many young people (particularly teenagers) who use them as standard communication tools. That kind of widespread use may make these particularly attractive for librarians serving communities of users who are already using these tools, used to them, and online a lot. Even for people who are not already users, they are relatively quick to learn (though not always immediate, thus perhaps not the best option for casual, one-time users). Transcript options might yield some of the benefits described above for email traces. They are also synchronous, which may mean that interviewing will be more natural and more conversational than via email or a Web form.

However, the "bandwidth", metaphorically speaking, is often quite low. Absent the use of voice or webcam, all you're getting here is text, possible with a few smiley faces thrown in, but no nonverbal cues, and so the potential for misunderstanding and time-consuming clarification might be high. These still require typing, and in fact that typing is now more immediate, since the other person is waiting on the line, as compared with an email exchange. This kind of ups the ante in ways, since this technology reinforces immediacy, but a slow typist can be very frustrating for their conversational partner. It turns out that accuracy in typing is not necessarily required—many chat conversations are filled with typos, misspellings, abbreviations and so on, and more experienced users don't find that problematic at all, though I can imagine most librarians would find it hard to adjust quickly to that kind of world and still feel like professionals, that is.

Chat and IM can also be really boring, especially when somebody goes away, and it doesn't take long for that boredom to set in. In a matter of a few seconds, people will start to get antsy and could easily drift away, psychically if not physically, and this may not be conducive to an intellectual exchange such as a reference encounter. There may well be a lot of potential in chat and IM, but I would suspect it would be for specific, targeted, niche audiences and communities.

While it's not currently used in any wide-scale way, at least as far as I know of, it's interesting to ponder what the use of **videoconferencing** or something like it might be like. This would enable one- or two-way direct, visual communication, either allowing the inquirer to see the librarian, or, with the right kind of hardware, them to see each other. In ways, this is just an

extension of the webcam notion we discussed under chat and IM above, but there are a range of options upwards from there, increasing in sophistication, bandwidth, image quality, and, of course, expense.

This would appear to resolve many of the concerns expressed about the reference interview. It's live communication that permits one or both parties to see those non-verbal things that are missed in textual interchange, allows for interaction to support clarification of the nature of the inquiry, and it's likely that there are settings in which this kind of communication would be ideal. Here there would be no barrier from the need to type, and there'd be no lag as with email or web forms. It also could help both librarians and users to feel that they're in a bit more personalized setting; it's not, of course, but it might be that just seeing the other person in a video window or on a screen puts some people at ease and makes them feel more comfortable.

It's also quite possible that it would creep them out. Being "on camera" can make some people quite self-conscious, and there might be lots of people who don't like the idea of staring into a camera either to do reference or to ask a simple question. Also on the disadvantage side of the ledger: the lack of a textual transcript (shy of manually transcribing a video recording which is incredibly time consuming and tedious; speech recognition software likely wouldn't help much right now), and, of course, the very large expense for software and especially hardware. High-end videoconferencing technology runs well into several digits to the left of the comma if not more, and that would put this out of the reach of all but the largest or most technologically saturated environments.

This is an intriguing idea that probably just wouldn't work, and I'm not surprised that few if any libraries have tried it yet. I could envision a service working in a corporate or government or organizational environment that already had video technology implemented throughout, and was already using it for meetings or other functions. Piggybacking an information service onto an already existing set of uses for video technology might be a shrewd way of encouraging people to use that service, but otherwise, I think video will be restricted to the webcam level for almost everybody else, at least for the foreseeable future.

The other major technology which has received a lot of attention and which a large number of libraries have begun to implement is **call center-based software**. This is really an adaptation of the kind of programs used by customer service centers for handling service requests via telephone or the web. This market has exploded in the last year from a few experimental uses of systems such as Remedy to a number of offerings directed specifically at the digital reference world. 24/7 Reference, LSSI, CS-Live, Convey, Citrix—these are the names one sees at conferences, in ads, and on listservs. They vary in terms of features and functions, but the basics are the same.

What this software does is enable an operator (in our case, a librarian) to handle requests in an integrated way. Most provide for some sort of live interaction with the user, via a chat window most likely, and give the librarian a number of options for that interaction. Besides the chat, some of these packages allow for:

- **scripts** to assist the process of communicating by allowing canned messages ("Welcome to our reference service. What can I help you with?" or something like that) to be sent instead of having to type them all the time.
- **page pushing** which is the ability to send a URL to the user's machine and have the page display in their browser window; handy for showing the results of a search
- **form sharing** where both the librarian and user see the same form, and as the librarian fills it in, the user is able to see how that's done; a potentially useful instructional tool

- **application sharing** where both can use the same software package such as a word processor or spreadsheet; I've also heard this referred to as **shadowing**
- **co-browsing** another term for much of the above, also called **escorting**, in which either party might take the lead in showing the other through a web search, for example
- **evaluation** by sending a brief form, for example, at the end of an encounter, asking people for feedback on the response they got

This terminology is still in flux, and might well continue to evolve, but it's easy to see that a good number of the features of interest here take advantage of the synchronous nature of the interaction, and sharing of features, trying to replicate or supplement what's possible in a face-to-face encounter around a browser window.

The obvious advantage of this kind of software is that it is (largely) designed for precisely this kind of interaction. I put "largely" in parentheses, because in reality, it's been adapted from more specific kind of uses, and at least in the early days, that genealogy made this software less than optimal. When you think of, say, a customer service selling clothes or providing technical support for hardware, the kinds of things these packages were originally designed for, there are similarities with reference work, but there's one glaring difference. Both involve interactions between people asking for help and people trying to provide it, both permit people to communicate and share resources, but the domains are very different. If you're providing tech support, there are a lot of things you might get asked—and I imagine they get a pretty wide range—but the large majority of those questions is predictable and more to the point repeated. You're not, for example going to be asked about how to fix a printer jam and then what the population of France was in 1572.

As a result, these packages were designed to deal with a relatively small set of potential questions, and to store ready-made responses to them. (Moreover, many companies use their question-answering services as gauges of the quality of their documentation and help systems, and view questions to these services as failures of their information resources. Contrast this with a lot of reference librarians who are proud of their statistics as measures of how well they're serving their populations. Could it be that reference questions are indications of the *failure* of cataloging and indexing systems? Should we be *happy* about the perceived drop in reference questions—maybe people are doing better on their own, and isn't that a *good* thing, in general?)

Reference work, of course, isn't like that. Anything and everything can come in, and that kind of variety can choke a system that's predicated on a more restricted range of questions. The current packages are better, but in some small way, their heritage persists.

In general, also, these packages are easy on the user, although some require them to download applications to support the chat or other functions, which isn't such a hot idea and is a potential impediment to use, especially by people at computers not their own.

On the other side of the coin, these packages are, in general, quite expensive; they can be attractive for large systems or cooperative environments to share the cost. There is also a pretty steep learning curve for most librarians, not only on the use of the software itself, which can be kind of tricky, but also "doing reference" this way, focusing on use of digital and networked materials, conducting interviews in this medium, and so on. Done properly, this can be an effective and valuable way of serving users, but it won't come easy or cheap.

What We Really Want

So it's pretty clear that none of the above are perfect or without potential problems. But let's indulge in a little fantasy/thought experiment while we're thinking about this. What would be the

important features or aspects of a technology or set of technologies that would be great across the board for most if not all situations? Well, it probably ought to….

- be easy to use and understand, both for the user and the librarian
- be commonplace or ubiquitous and easy to get at, especially not requiring any add-on or plug-in on the part of the user
- provide high bandwidth, i.e., allow for a great deal of interaction between user and librarian
- allow for a high-quality, professional-level interview
- permit user and librarian to make enough of a personal connection to yield a productive interaction
- be free of time lag, unless either party desires it (to compose a thoughtful response, for example)
- allow the librarian and perhaps also the user to push information in some way
- support evaluation of the service
- be comfortable and affordable on both ends

Surprise—no technology yet satisfies all of these. And as situations and environments vary, some of these will be of greater and lesser importance. These might serve as some guidelines in thinking about, evaluating, and asking questions of vendors about various technological options.

Issues Raised by Technologies

Incorporating the use of new technologies such as these into reference work is going to make many things very different, and raise lots of questions. In this section, I'd like to introduce some of these issues and work through them a little.

First, and perhaps most obviously, is the question of **technological infrastructure.** It goes without saying that if a library reference service is going to start using email or Web forms or chat or call center technologies in their work, they're going to have to have the necessary hardware and software and support for those to make it effectively and correctly. For many libraries, this won't be a problem, but for libraries with small budgets, thinner current infrastructure, or who are thinking quite ambitiously about what they want to do, this will mean an initial outlay of money and time to get themselves up to speed. This may involve upgrading current computers, buying new ones, adding new peripheral devices (webcams, microphones, scanners, etc.), purchasing or licensing software, or integrating new software with what they currently have (catalog, databases, email, campus or other local networking, and so on). That may or may not be cheap, and may also require additional staff time, either internally or externally. There are also potential training issues here, which I'll discuss in the next chapter.

Technological infrastructure is not only a concern on the library's side. The required setup on the user or client side may be a concern as well. If the library uses software that assumes a particular kind of hardware or software on the client side (say, that won't work with Macintosh computers, or with browsers other than Netscape or Internet Explorer), this may make it difficult or impossible for some users to get to the service, or to use it fully. In addition, some systems require users to download applications or software, or to accept cookies, which also are potential barriers to use. Again, depending on the nature of the users and communities for which the service is being designed, these may or not be important or problematic concerns. Libraries that can assume a particular baseline or set of technologies and software can take advantage of that assumption in designing their services.

The enthusiasm and excitement over collaborative services leads quickly to a concern about **standards** to help individual libraries work together. At present, there are no such standards; the

QuestionPoint folks have developed a web form for members to use in moving questions around, but this is a de facto standard only for the QP universe, at least so far. A discussion has been ongoing for quite a while now around a potential standard called QuIP (for Question Interchange Protocol); Dave Lankes of the Virtual Reference Desk and Michael McClennen of the Internet Public Library among others have been working on this.

Standards in any environment are by their nature often complicated and involved; standards work here is no exception. There are a large number of pieces of information which could be represented in a question as it's being sent from one institution to another, not only to help in crafting a response, but also in making sure it gets back to the correct user, allowing it to be stored and retrieved as part of a database of responses, recording the history of who has looked at the question, worked on it, and found potential sources for a response, allowing for multiple iterations or versions of it, profiling users and institutions for future reference, and so on. This work is ongoing, and recently the National Information Standards Organization (NISO; the folks who gave us Z39.50 and the like) has held a workshop and appointed Committee AZ to develop a national standard for question interchange.

The **design** of the service, particularly the face that is presented to the public, is also important. We've had library web sites for quite some time now, and any digital reference service needs to be tightly integrated within a library's web presence, to make it a seamless part of the library and to reinforce its centrality within the library. It also should be easy to find, clear and easy to use, and lay out its expectations and policies. Call it something obvious, like "Ask a Librarian" or "Get help now", or under a link marked "Can't find what you're looking for?" and put those links everywhere—on the front page, on every other page of the library web site, even in the catalog and database pages if you can. Don't use jargony terms like "Electronic Reference Desk" (how can a desk be electronic?) or "Adult Services" which we all know means something quite different on the Internet. I also generally dislike cutesy names like "Answer Express"; they really get in the way of people finding and understanding what is going on.

Since in many cases, it's difficult to assume much on the part of the user, I'd think a service would need to allow for users with all levels of technological sophistication and experience, with a wide range of bandwidth, and make it as easy as possible for people to use. This doesn't necessarily mean lowest common denominator, but it does mean allowing people with very slow dialup connections to be able to use a service via email or a web form. There's no reason services like those can't be developed right along side higher-end or higher-bandwidth services that might use voice or streaming video, if those are likely to be of use as well.

<insert screen shots about here>

Figure 1. Kansas City, Kansas Public Library Quite a simple but effective design, pointed to directly off the library's main web page (as are the others shown here); this page demonstrates to me the power of a straightforward page layout, one that would load quickly on a dialup connection, and that conveys a lot of information without getting in the way. Great job.

Figure 2. Public Library of Charlotte and Mecklenburg County, North Carolina Lots of ways to get at the services, the page is nicely laid out, well integrated into the library's overall web site design.

Figure 3. York County, South Carolina Public Library People with common questions are gently guided to where they can get help, the form is simple, but the Help Us Help You statement is good, and the big question mark at the top certainly gets the point across.

Figure 4. QandANJ.org, I love the headline, which inspires confidence and gets the point across. Lots of good information throughout here to help the user know what to do and expect, in a relatively simple design and a simple non-goofy logo.

Glitches. They always happen—usually when the boss or the board of trustees is visiting. They are inevitable, and we have to figure out what to do when they do. If a person is at the desk or on the phone and something goes astray, we can ask them to wait, put them on hold, take a number and call them back, and so on. We'll develop similar sorts of mechanisms in digital environments—if a chat session suddenly evaporates, and you have a person's email address, you can send a message to follow up. If you don't have an email address, there may well be little you can do other that wait and hope they try to reconnect. If email bounces, it's like a disconnected phone number, and again, other than trying to send the message again, this may be a lost patron and wasted effort. Servers will go down without warning and other mysterious problems will crop up. We would certainly hope that the software we use will continue to grow more robust and dependable and that problems like this will be minimized through training, experience, more durable infrastructure and so on, but we'll also develop good professional ways of dealing with the problems as we go. It's no use denying, though, that they'll happen.

An increasingly serious concern is the question of **authentication** of users, especially in the use of licensed proprietary digital resources. Here library type likely makes a significant difference, at least in terms of what can be expected and done. It's likely that most academic libraries and probably many special libraries can assume that their communities are relatively used to authenticating to get access to services such as email, intranets, library services, and so on, and may already be taking advantage of institution-wide authentication mechanisms. Getting those mechanisms to work together with digital reference services is the next step: relatively easy if it's a simple email or web form, more challenging as the sophistication of the software approach rises. For example, my university library does a very good job with providing access to all kinds of digital materials, making them easy to find and so on, mostly through IP addressing and proxy servers. But to authenticate to the library per se, for requesting materials or to see my circulation records, I have to give my bar code number instead of my university computing password and id. I'm sure there are lots of good reason why these authentication mechanisms don't yet interoperate, and I hope they're working on it, but from a user perspective, it's a pain in the neck to have to reach for my ID card when I want to renew books. There are many questions to be asked of software vendors about interoperability on many levels, including authentication, but these are questions those vendors need to be able to answer.

Public libraries, and probably most school libraries, are in a different situation. Some public libraries currently ask, for example, for a library bar code number to be able to get remote access to licensed databases, and moving that mechanism over to a digital reference service looks much like what we discussed just above. But many don't, and they're going to have to make some decisions. Are they going to restrict their services (all or part of them) to just those who have library cards? If so, how will they enforce those restrictions, and what about people who are members of their service communities but don't have library cards? Will they offer different kinds or levels of service to people willing and able to provide authenticating information? Will they explore other mechanisms of authenticating (say, asking for a local address or phone number; these are less secure than library card numbers but at least are something)? And if they don't require authentication, how will they cope with licensing issues and restrictions?

All very good questions, and though these are raised in the context of public libraries, they cut across all types of library in one important way. We never asked these questions of people before, at least not from the word go, in a reference interaction. In face-to-face or telephone reference, we typically only ask about where somebody lived or whether they were members of the community if it was relevant; say, if the request was going to use library resources extensively or if

materials needed to be circulated or mailed or faxed or if we needed to call somebody back. But it certainly wasn't the first question out of the reference librarian's mouth, which is what an authentication methods amounts to. If somebody presented himself or herself at a reference desk, we tried to help them, first and foremost, and worried about whether they were paying for the service later if at all (some private academic libraries and subscription libraries do require proof of membership to use the service, to be sure, but this is a small number overall). And, of course, if people are in the building, they have access to the full range of resources and services, while they're in the building, as specified under most license agreements.

So here's the conundrum. We'd love to believe that digital reference is going to look like traditional reference in as many ways as possible. But it's clear that in this respect, it won't be. If a person is physically in the building (or, I guess, on the phone still), they'll continue to enjoy the privilege of full, unquestioned service in most respects. Once they cross the threshold (or fail to cross it, depending on your point of view), they're different, though, and will need to tell us who they are and more importantly demonstrate their financial support of the library to be able to use some resources and perhaps the service altogether. This is quite a different perspective on the reference service than most of us are familiar with.

And of course there's really nothing wrong with reserving the precious time of reference librarians and the use of costly information resources for people who are actually paying for the service in one way or another. In fact, it makes a lot of sense. But it's not the way we're used to operating, at least in most places, and so it will feel weird for a lot of people to work this way.

This will get even further complicated in collaborative environments. One of the pieces of information that might need to get included as questions get shipped around the world in cooperative services is what the user has the right to get at, based on where they live, where they go to school, and so on. If, say, a resident of Oneida, New York asks a question of her local public library, and they forward it on to somewhere else, and Syracuse University tries to respond, the librarian at Syracuse is going to have access to lots more and more specialized resources and databases than the public library, but the patron hasn't paid for it. What does the librarian do, and how will she avoid getting in trouble with the vendor if they find out and try to enforce the license agreement? Moreover, how does the librarian in Syracuse know what Oneida's library has paid for? Add this to the mix—many resources are now purchased through consortial arrangements, some of which cross library types and provide a kind of web of permissions and authority—and you get a mess.

It might be easier than we think. It may well be, now or in the near future, that there's a baseline of services that a great number of libraries license (like, for example, WorldCat, ProQuest, _Encyclopedia Britannica_, PsycINFO, and so on), and that many questions can be answered using those, perhaps not ideally but at least reasonably well, and that might reduce anxiety about this somewhat. But it's difficult to imagine these concerns evaporating entirely or soon, and practice will, once again, have to evolve around these issues.

The Other (Real?) Issues Raised by Technologies

In the previous section, I discussed some of the immediate concerns and issues that come up with one or more of the technologies that are currently being used or discussed for reference work. Those are mostly practical or logistical issues, and they are important. But now I'd like to go a step further and think about some deeper things, a couple of which came up above, most of which didn't.

For example, in the discussion earlier on standards, I mentioned the potential for **profiling users** in the course of shipping their questions around. This could be a real boon both for users and services, and harkens back to days when reference work was local in nature and people knew their librarians and vice versa. To be sure, it was never completely like that, but even Samuel Green in his 1876 article mentioned more than once using knowledge of particular members of his community in crafting responses to their questions, understanding their needs, and even suggesting resources for questions they hadn't asked yet. He knew—and librarians who have the luxury of getting to know individuals well know—their general preferences, who likes to get lots of things to wade through and who likes a specific answer, who speaks French or Japanese, and so on. In the hands of an experienced and trustworthy professional, that kind of meta-information about people and their needs can be invaluable.

But will people stand for it, especially in a time increasingly concerned with the privacy of personal and identifying information? People trust libraries and librarians (we hope!) but they may draw the line at telling us things like their preferences for information if the requests are mediated over the Internet, and especially if those preferences are going to be shipped all over the world to other librarians. It's a shame, really; *we* know that we'd use this information in a professional and trustworthy fashion, but we might be in the minority. Not to mention that people might not be willing to sit still for telling us a lot of this kind of information to get a simple (or seemingly simple) question answered. Still, it's worth pondering.

A relatively simple idea, though one that would likely take more than a little work to implement would be to enable people to **track the status of their questions**, much like FedEx or UPS permits with package shipments. Give each question a unique code number, and include a web address when an acknowledgement goes out, so people can see whether the question is being worked on, if it's been sent somewhere, perhaps even who is working on and an estimate of the time it might take until a response is forthcoming.

The use of the technologies we discuss here, and the ones that will inevitably follow, provide librarians with a tremendous opportunity to be **innovators**, to think ahead to the kinds of ways in which people will be interacting with information and then to plan to be there when those people need help. We already see huge numbers of people seeking information through Google and Yahoo and their cousins, asking questions in chat rooms and over instant messaging services, and surfing the web through handheld digital wireless devices of many kinds. How do we do reference there? What does a "reference desk" look like in a chat room? How do we help people when they're searching Google? How about when they're searching our own catalogs or licensed databases? What's the next technological plateau, and how do we get there first? These are not easy questions, and we may not be able to do everything, but I only hope that somebody, somewhere reads these questions and thinks to themselves, "Hey, we can do that." Is it you?

Technological Expectation

There has been considerable discussion, in these early days of digital reference, about what kinds of questions lend themselves to being asked and answered using these technologies. Some librarians say they'd prefer to handle only quick, ready-reference questions, often because they feel they can't do a reasonable reference interview in the digital world. Others think that this is the perfect opportunity to handle the deeper, more research-oriented queries, taking advantage of the chance to assemble a thoughtful response. Of course, much of this depends on the nature of the communities involved, the library, technologies involved, and so on.

I'd just make a couple of general observations on this area. First of all, the overall technological environment in which we all now operate is likely already producing a change in the kinds of questions that will come to libraries, including a whole new generation of specific questions

based on the technologies themselves. We've been dealing with "technological" questions for quite some time now ("How come this CD-ROM doesn't work?" "Can you change the toner/fix this paper jam/give me change for the printer/help me unfreeze my browser/sign me up for an hour of computer time?"), but lots of librarians are discovering they now need to be able to respond to questions about matters more exotic: passwords, proxy servers, authentication problems, multiple database interfaces, policies, search techniques, printing issues, and on and on. I can't imagine this will lessen or change much in the foreseeable future, so we might as well get used to these.

Secondly, the push for services that are always open ("24/7" services, not to be confused with the specific service 24/7 Reference) raises the not unrealistic expectation on the part of users that the answers will come back really fast, if not instantaneously. This is not intended as criticism or a plug for asynchronous-only services, but I know that if I were entering a question into a chat box or some other live mechanism, I'd be wanting and expecting an immediate answer. This significantly raises the stakes in many ways, and libraries that mount real-time, synchronous, live services, are going to have to be able to back up those services with the resources of all kinds to pull them off. This is not an impossible task, but I think this is worth thinking about very carefully before flipping the switch on a service such as that.

Now, if I had sent a question via a Web form or email address, I probably wouldn't expect an immediate reply. I wouldn't mind if I got one, but my expectation would be that somebody would get back to me with a response to my question in a little while. These expectations are partly personal on my part, but also largely based on my experiences with email, Web forms, and synchronous services, and I would assume that many (but, significantly, not all) Internet users have similar experiences and expectations.

I believe that users of these services are going to be willing to accept the consequences of the environment in which they make their inquiries, especially if we tell them what those consequences are. A reference service using a Web form and email that tells people they'll get an acknowledgement within 3 hours and an answer within 24 lets a potential user make up their own mind about whether to use it. Paired with a chat-based service that gives an immediate answer but says that they'll only be able to get a quick answer to a quick question, now the user has choices, and can make an intelligent decision about how and where to make their inquiry. Yes, I know, there are lots of people out there who would be challenged in making such an intelligent decision, and there will be lots of times when people would send deep research questions to the chat line and quicky facty questions to the email, but it wouldn't be hard to figure out ways of gently sliding them back and forth, or suggesting they call or stop by the library, or whatever. (The stupid, like the poor, will always be with us.)

It is also virtually certain that these kind of services will engender use by people we didn't traditionally serve in the past; people who wouldn't necessarily think of or bother to call or visit a library to get help on an information problem. We might well also lose people who won't or can't use technologies in these ways, but I suspect the number of people turned off by the fact librarians are now doing reference digitally and thus stop using libraries altogether in person or by phone is vanishingly small. Of course, these are all empirical questions, and research and practice will help us to know better what happens as these changes emerge.

Matching services and expectations—both of users and staff—will be an important component of the next generation of reference service development and work. That said, there's a great deal about "reference work" that is starting to shift and grow and change; we'll talk more about that evolution in the next chapter.

Some Questions

How well established should a technology be before we adopt it?

Should we bide our time and wait until the technology environment settles down a bit? Or perhaps get more involved, even develop new and necessary applications?

Are reference questions *ever* an indication of the failure of our systems? Should one of its goals be its own reduction in volume, traffic, importance?

On page 4-17, we get back to "what is the library" again. Technology seems to challenge this notion repeatedly…how can we work to develop a clear and easily understood notion of "the library" that we and users can share?