Measuring Service Quality

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Measuring Service Quality

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Introduction

Martha Kyriillidou and Fred M. Heath

Libraries are the crucible of genius. In the 500 years since the invention of the printing press, libraries have been at the center of a remarkable flowering of the human intellect, serving as repositories of the human experience while promoting structured inquiry and critical thinking. Libraries are fundamental to the intellectual experience and the natural creativity of the mind; they are core services at every postsecondary institution. Indeed, there are no great universities without great libraries. What, however, defines a great library? What constitutes excellence or effectiveness in research library services? How does a library evaluate—for itself and its diverse constituencies—whether it is delivering the best possible services for the considerable investments made in its operations?

Library Trends, in a ground-breaking issue under the editorship of Thomas Shaughnessy of the University of Minnesota, first addressed this question in 1996. In his introduction, Shaughnessy observed that a focus on inputs had traditionally driven the research university community. There was in place, he suggested, a belief that higher investments or expenditures somehow implied better outcomes or higher quality (Shaughnessy, 1996). The question of the relationship between expenditures and quality was joined. That important issue of Library Trends added sparks to the ongoing research of library effectiveness with far-reaching implications.

Research libraries have always placed value in describing and evaluating their institutional resources and services. The Association of Research Libraries (ARL) has probably the best statistical data series in the history of higher education with data describing libraries back to 1908. The com-
mitment to assessment was strengthened in 1994 when ARL adopted as a strategic objective "to describe and measure the performance of research libraries and their contribution to teaching, research, scholarship, and community service." By this action, the Association of Research Libraries demonstrated the previously stated desire by major research libraries "to maintain the useful approaches of the past and explore responses to the challenges of the present and future" (Pritchard, 1992, p. 4). The 1990s was an era of exploration, discovery, and revelation not only for libraries but for the whole world, in many ways changing the established paradigms under which long-held assumptions were based and forcing libraries to focus on the basic reason of their existence. At a meeting in Tucson in the winter of 1999, research librarians from around North America met under sponsorship of the Association of Research Libraries to discuss the issues pervading library service quality. The New Measures initiative was a joint undertaking of ARL's Research Library Leadership and Development Committee and its Statistics and Measurement Committee. At that meeting, the participants affirmed the need for alternatives to expenditure metrics as measures of library performance (Blixrud, 1999).

There emerged a general consensus that rising demands for evaluation and accountability required library administrators to develop alternatives to the focus on inputs or expenditure metrics. A few months later, at the ARL annual meeting, the New Measures group considered and endorsed a pilot project proposal by Texas A&M University. That proposal entailed the use of a protocol well-grounded in the business community—SERVQUAL—to assess service quality in research libraries. The launch of the Texas A&M project served as the genesis of this issue of *Library Trends*. As events evolved, from among thirty volunteer ARL libraries, twelve were selected to participate in the first phase of the pilot project. The January 2000 Midwinter American Library Association meeting brought together project planners, participants from the twelve ARL libraries, and invited researchers in library service quality. There it was agreed that the next annual meeting of ARL in October 2000 would feature a symposium of leading researchers on library service quality. At the symposium, the ARL/Texas A&M initiative would be discussed along with other important research efforts in North America, as well as projects from the United Kingdom, Europe, Australia, New Zealand, and elsewhere. Presented here in this volume is the latest thinking and research on library service quality as it is being articulated by leading researchers and professionals in the field and presented at the October 2000 symposium.

The planned symposium was given further impetus and validity when the ARL/Texas A&M project was awarded a three-year grant by the U.S. Department of Education Fund for the Improvement of Postsecondary Education (FIPSE) to further develop the service quality protocol and to extend its application beyond research libraries to other postsecondary
settings. In spring 2001, more than forty higher education institutions and their libraries have expressed an interest in participating in this three-year pilot effort and test the emerging protocol.

As observed, the Texas A&M pilot project had its origins in the gap theory of service quality developed by the research team of Parasuraman, Zeithaml, and Berry (1985). Their ground-breaking research led to the development of the SERVQUAL protocol. While gap theory has several layers of complexity, at its simplest, service quality can be measured by the gap between customers' desired service levels and the perceived level of service delivery. Further, from the perspective of the authors, in the definition of service quality, only the perceptions of the customers matter. Designed initially for the for-profit sector where it remains an acknowledged industry standard, SERVQUAL has also been widely applied elsewhere. In fact, over eighty doctoral dissertations have been written in the past decade to assess its applications to fields as diverse as ecology and historical preservation. Danuta Nitecki (1995), one of the contributors to this issue, initially explored the study of its application to libraries.

The SERVQUAL instrument, reground and evaluated within the research library community by the Texas A&M University research team, emerges as the LibQUAL+ protocol. The first articles of the issue treat aspects of the development of LibQUAL+. Colleen Cook and Fred Heath describe the process by which "gap theory," as expressed in SERVQUAL, was re-grounded for the research library environment through a series of interviews with faculty, graduate students, and undergraduates at participating universities across North America. Sixty interviews were conducted altogether and were then transcribed, loaded into a software analysis package, coded, and analyzed. The results of those interviews helped to prepare the Web-based questionnaire that undertook to measure, in the users' own words, their assessment of library service quality. The users' penchant for self-reliant access to library resources is addressed at some length and calls into question some long-held assumptions about user behavior.

Five thousand respondents from twelve pilot institutions were captured by the Web-based questionnaire referred to above as part of the quantitative evaluation of the protocol developed. The quantitative data were analyzed by the Texas A&M team. Bruce Thompson and Colleen Cook report their findings of an overarching construct of library service quality as well as the four dimensions that define the construct: affect of service, reliability, access to information, and library as place. The affective behaviors—staff demeanor, knowledge, and responsiveness—and reliability are as important in libraries as they are in the business world. Comprehensive collections remain important, and faculty and graduate students often fault their libraries for the absence of in-place collections. Increasingly, however, there emerges an expectation of ubiquitous access to information, regardless of format or mode of delivery. As a place, the physical
library still serves many clients in a myriad of practical fashions while it diminishes in centrality for others.

Steve Hiller from the University of Washington compares the findings of LibQUAL+ with triennial surveys performed at the University of Washington. He compares the two methods and discusses the design, content, and delivery mechanisms. He reiterates the value of LibQUAL+ as a standardized instrument for interinstitutional comparisons and discusses the cost savings of a Web-based survey. He finally compares the University of Washington Libraries' survey with LibQUAL+ in such areas as response and representativeness of survey population, similarities and differences in results, and whether the right questions are being asked. His analysis provides a useful external check to the emergent paradigm now being tested by ARL and Texas A&M, lending important corroboration while suggesting opportunities for further study and affirming the importance of both standardized and locally developed assessment tools.

Patience Simmonds and Syed Saad Andaleeb of Pennsylvania State University, Erie, describe their own attempt to use SERVQUAL dimensions to predict and explain the use of physical library facilities in an era of rapidly expanding electronic access. Their article explores the tenuous relationship among expectations, perceptions, and behavior. In their article, the concept of library as place, also examined by Hiller and Cook and Heath, is analyzed from a different perspective. Resources and familiarity with the library were significant explanatory variables. An examination of the standardized beta values shows that one's familiarity with the library had the greatest impact on library use, followed by resources, tangibles, and gender. Their findings echo the preoccupation of Web-based information service providers with a concept known as "stickiness"—i.e., the extensive use of known information resources as one's familiarity with them increases.

Other authors make clear that there are many lenses through which to view the issue of library service quality, and different methodological approaches by which to attempt its measurement. Shelley Phipps of the University of Arizona approaches the issue of service quality from the perspective of the learning organization. Transformation of research libraries, she observes, proceeds from the commitment to the voices of users certainly, but also to the voices of staff and of library processes themselves. The learning organization then acts upon the information it receives "experimenting, seeking new perspectives and new methodologies, and designing new organizational systems that involve, engage, develop, and increase the commitment of staff and partner with customers to design the future they need that includes library values and vision."

Rowena Cullen, head of the School of Communications and Information Management at the Victoria University of Wellington, offers an overarching view of efforts to study user satisfaction in libraries and gives
an explanation as to how user satisfaction relates to service quality. In her study, she discusses a model of user satisfaction as both a micro-level response to individual transactions and at the macro-level as an outcome of service quality. She cautions that there is a lack of resolve in the profession to address the gap between users’ expectations and our professional perceptions of these. The lack of resolve may be due to limitations imposed by our reliance on measures of “objective reality” that have not always met customer needs. Cullen emphasizes the need for a culture of assessment and, foremost, the need for action that is long overdue.

Pioneers in the arena of library service quality—Danuta Nitecki, associate university librarian at Yale University, and Peter Hernon, professor at Simmons College—offer added perspectives. Developing an argument that differs from Cullen in emphasizing the affective aspects of satisfaction versus the cognitive aspects of service quality, their article also examines the relationship between these two concepts and underscores the importance of the local context in the assessment paradigm. The value of service quality assessment as a local planning issue is a primary focus of the article. Caution, they stress, is essential in designing a process of normative cross-institutional data collection or of making generalizations from it. Higher education and library perspectives are also to be developed in relation to recognition and certification programs such as the Malcolm Baldrige National Quality Award and ISO 9000.

As we learn from Roswitha Poll, director, University und Landesbibliothek Münster, Germany, concerns about library service quality are not limited to North America. Her article reports on work currently underway in Germany using the Balanced Scorecard approach, a concept for an integrated quality management system across four perspectives: users, finances, internal processes, and potentials (innovation). Poll indicates that “the basic model of the Balanced Scorecard adapted to the conditions of academic libraries, deviates from the original model in placing not the financial, but the user perspective foremost. Libraries do not strive for maximum gain, but for best service.” But, as Poll reminds us, the basic concept is not to look at the different quality aspects separately but rather as part of an integrated system.

In his article, Ian Winkworth of the University of Northumbria, Newcastle, England, catalogs the pressures for accountability in the United Kingdom and the rise of public service performance measurement across the nation. The role of the Standing Conference of National and University Libraries (SCONUL) in the development of academic library performance measures is discussed, and their practical application in local situations is described. The need for satisfactory frameworks for performance measurement is reiterated in this article as well as the promising potential of international collaboration on assessment efforts.
Philip Calvert of Victoria University of Wellington reports the findings of a remarkable cross-cultural study of university library student expectations of service quality between China and New Zealand. The results of his study show that there exists a global set of customer expectations that can be used to measure academic library service quality and consists of three dimensions: staff attitudes, the library environment, and services that help users find information. Calvert asserts that these dimensions are similar across user groups, across different organizations, and across different countries. His study of customer expectations in New Zealand and China also finds that “national culture is not a major precursor of attitudes to service quality so it will not impede efforts to set international measures of service quality.” Echoing the sentiments of Ian Winkworth, Calvert suggests the need to examine the international applications of LibQUAL+ and other instruments.

This issue of Library Trends concludes with the contribution of John Carlo Bertot of Florida State University and an examination of the challenges of service quality assessment in a networked environment. He offers an overview of statistical and performance methods that librarians may find useful in assessing networked-based services. His article suggests a framework for network-based assessment that may allow library administrators to demonstrate the uses of their electronic resources and services. His own conclusion, that library researchers and practitioners must engage in a perpetual cycle testing theory and developing proven methodologies in order to advance the service quality assessment, underscores the messages of the other authors and effectively serves as the theme of this issue of Library Trends.

Measuring library service quality can be both a project as well as a process to be continually enhanced and improved. The findings reported in this volume and their implications have far-reaching consequences for the future of libraries and their evaluation and assessment. Library service quality is a concept that is becoming less elusive and increasingly recognizable and actionable. As standardized protocols like LibQUAL+ are emerging and flourishing side by side with local implementations emphasizing quality improvements, there is a distinct possibility that libraries will be in a position to develop a better understanding of what constitutes and determines various levels of quality in certain environments.

Understanding library quality will possibly lead us to develop not only an understanding of preferred and best service practices but also toward widespread recognition of standards for library quality, especially to the extent that users have an overarching preconceived notion of library quality. For example, to the extent that users are expecting libraries to enhance their self-reliance in seeking information, libraries will be much better off acting in concert and cooperatively to empower users to achieve basic levels of self-reliance in their information-seeking behaviors through
services such as cooperative online reference and information literacy instruction programs.

At the same time as basic levels of library service quality are achieved in a cooperative library environment, the expectations for highly specialized services for the local community of users will increase, together with a recognition that innovation and local differentiation of resources and services is increasingly important. Whether all higher education and research institutions will be able to afford to engage in sustainable global library cooperative programs, and at the same time develop highly specialized services for their local user communities, is as much an issue of wise deployment of resources as it is an issue of political willingness to continue to perceive libraries as the crucible of genius and civilization, a symbol for knowledge and wisdom, a portal for lifelong learning and discovery.

REFERENCES
Users' Perceptions of Library Service Quality: A LibQUAL+ Qualitative Study

Colleen Cook and Fred M. Heath

Abstract
Service marketing has identified the customer or user as the most critical voice in assessing service quality. Before assessments can be made of service quality in ARL libraries, it is essential to investigate what connotes service quality in the minds of library users. Today the dimensions of library service quality among the ARL cohort are not fully understood from the user perspective. The LibQUAL+ project attempts to identify those dimensions and measure the gaps between expected service and perceived service in each dimension. This article describes the interviews conducted with users of research libraries across North America in the first round of work on the still-evolving LibQUAL+ instrument. The interviews provided a rich pool of information about the users' own behaviors, their perceptions of what a library should provide, and their interactions with that important resource as they pursued their diverse objectives at their respective universities. Analysis of the interviews contributes to the identification of the dimensions of library service quality, which will be further tested in future iterations of the LibQUAL+ tool.

Scenario
I hurried back to the university library from an interview I had just conducted with a graduate student in health sciences in order to meet my colleague for our end-of-the-day debriefing session. The student with whom I had spoken was passionately self-reliant—typical of the graduate students we interviewed—and he had taken to the purpose of my visit with an earnest goodwill. We spent two hours on a late afternoon exploring the concept of service quality in a research library from his

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perspective. On the whole, he valued his experiences at the university, one of the finest public institutions in North America. For the most part he recognized that its libraries were well-funded, boasting the comprehensive collections and rich array of databases that allowed him to pursue his independent methods of information-seeking largely without impediment.

But sometimes the system got in his way. Instead of removing barriers to his quest, libraries seemed to be a party to their erection. A system that appeared so complex and rational could sometimes break down completely. He explained that his interdisciplinary research often required document delivery from other libraries across the vast campus. He would go to the departmental library to pick up the items he ordered only to find that all did not go as expected. “And then you get this crappy looking fax thing that’s really ugly. That’s usually what happens. And then they put all those stamps on it about copyright notices and everything. I can understand that, but do they have to put it over the text? That’s what they do sometimes” (137:622-625*).

He kept saying that what he wanted was “ubiquity of access,” a concept that resonated with me the first time he said it and became more meaningful to me each time he used it. Would it be too much, he asked, for the modern research library to ensure that he could obtain access to the information he required at any time of the night or day, without regard to its format? (137:198-209).

Just what were all these interviews with some of the brightest students and most highly sought-after faculty in North America telling us about the necessary components of service quality in the research library? And just what, if anything, did a carelessly placed stamped notice, obliterating the muddy text of a fax transmission, have to do with service quality?

PROBLEM STATEMENT

Service marketing has identified the customer or user as the most critical voice in assessing service quality. Before assessments can be made of service quality in Association of Research Libraries (ARL) libraries, it is essential to investigate what connotes service quality in the minds of library users. Today the dimensions of library service quality among the ARL cohort are not fully understood from the user perspective.

Many service marketing and library and information science researchers have defined service quality in terms of the Gaps Model of Service Quality, based on a service quality model posited by Parasuraman, Zeithaml, and Berry (1985). Their construct describes five gaps that produce “ Disconnects” in service quality. Library researchers, adhering to the desire to accentuate a user-driven perspective, have focused their attention upon

*This and subsequent notations refer to individual interviews cited in the appendix with the page numbers where the comments appeared in the LibQUAL+ report—e.g., 137:622-625 refers to Interview 37 of a Graduate Student in the Health Sciences whose comments are on pages 622-625 of the report.
the fifth gap—i.e., “The quality that a consumer perceives in a service is a function of the magnitude and direction of the gap between expected service and perceived service” (Parasuraman et al., 1985, p. 46).

In an age of accountability, it is more important than ever for library administrators in the continent’s largest libraries, who—in the aggregate—spent more than $2.5 billion in 1999 on operating expenses, to be able to evaluate how well service is provided from a user perspective. With data assimilated across libraries, research library administrators can turn to model service providers for best practices and can gauge their own performance across appropriate peer groups.

**METHODOLOGY**

Much research in service quality has been conducted in the commercial sector, and a modest body of literature is growing in the library and information science sphere as well (Andaleeb & Simmonds, 1998; Coleman, Xiao, Bair, & Chollett, 1997; Cook & Thompson, 2000, in press; Cook, Heath, & Coleman, 1999; Edwards & Browne, 1995; Hébert, 1993; Nitecki, 1995). A protocol, SERVQUAL, developed in the 1980s by Berry, Zeithaml, and Parasuraman (Parasuraman, Berry, & Zeithaml, 1988, 1991; Parasuraman et al., 1985, 1994; Zeithaml, Parasuraman, & Berry, 1990) for evaluating service quality from the customer perspective has led the field of service quality assessment. As de Ruyter, Bloemer, and Peeters (1997) noted: “On an operational level, research in service quality has been dominated by the SERVQUAL instrument, based on the so-called gap model” (p. 390).

To develop a theory for the construct of library service quality from the user viewpoint, grounded theory, whose central feature is “a general method of [constant] comparative analysis” (Glaser & Strauss, 1967, p. viii), was followed. In this methodology, “theory may be generated initially from the data, or if existing (grounded) theories seem appropriate to the area of investigation, then these may be elaborated and modified as incoming data are meticulously played against them” (Strauss & Corbin, 1994, p. 273). Using the dimensions identified in SERVQUAL as a starting point, the concept of library service quality from the user perspective was explored. The SERVQUAL dimensions are:

- **tangibles**: physical facilities, equipment, and appearance of personnel; reliability: ability to perform the promised service dependably and accurately; responsiveness: willingness to help customers and provide prompt service; assurance: knowledge and courtesy of employees and their ability to inspire trust and confidence; and empathy: caring, individualized attention the firm provides its customers. (Parasuraman et al., 1988, p. 23)

**A series of sixty interviews with a diverse set of library users was conducted at nine ARL libraries in spring 2000. Faculty of all ranks and graduate and**
undergraduate students from a variety of disciplines were interviewed through a series of open-ended and unstructured questions based on Lincoln and Guba’s (1985) recommendation for naturalistic inquiry studies:

To put it another way, the structured interview is the mode of choice when the interviewer knows what he or she does not know and can therefore frame appropriate questions to find it out, while the unstructured interview is the mode of choice when the interviewer does not know what he or she doesn’t know and must therefore rely on the respondent to tell him or her. (p. 269)

A major tenet of grounded theory is its insistence upon safeguarding multiple perspectives through process. As Strauss and Corbin (1994) noted: “Perhaps not every actor’s perspectives can be discovered, or need be, but those of actors who sooner or later are judged to be significantly relevant must be incorporated into the emerging theory” (p. 280). Grounded theories are rooted directly and indirectly in the actors of the phenomenon studied.

To gain an understanding of the context of the actors in research libraries, each person interviewed was first asked to list the libraries that he/she had used throughout his/her academic experience. Interviewees were then queried regarding their concept of service quality in the research library environment. The dimensions of service quality identified in the SERVQUAL instrument served as a basic set of issues that were initially explored, but neither the exact wording nor the order of questions was predetermined. In keeping with grounded theory and the unstructured interview format, the answers to open-ended questions served as guideposts to further questions. Dexter (1970) described such interviews as a conversation with a purpose. Grounded theory methodology insists that “no matter how general—how broad in scope or abstract—the theory, it should be developed in that back-and-forth interplay with data that is so central to this methodology” (Strauss & Corbin, 1994, p. 282). Thus insights gained from one interview were incorporated into subsequent interviews and explored until saturation was attained and no new information was forthcoming. Each interview was transcribed and analyzed using Atlas TI, a software package for performing content analyses, particularly amenable to grounded theory analysis.

**Participants**

The member libraries of ARL are among the most important research facilities in the world. While encompassing a cadre of public and specialized libraries, ARL membership is composed primarily of libraries from North America’s preeminent universities. The membership shares a commitment to excellence in support of research and instruction. In large measure, that commitment is acknowledged by the post-secondary world. The 111 libraries that comprise its academic library membership are
generally regarded as the apex of an important pyramid of more than 3,000 post-secondary libraries on the continent. Their richly diverse collections support the missions of the institutions of which each is a part and draw scholars from around the world who seek to mine their treasures.

The faculty at these universities are also regarded as among the very best teachers and researchers in North America. Their reputations in the classroom and laboratory and their impressive lists of presentations and publications are testaments to their collective accomplishments. Interestingly, they also share common origins. As the investigators moved around North America interviewing faculty about their views on research library quality, they found that the professorate uniformly completed their graduate degrees from institutions that were Research I or II universities, most of whom were also institutional members of ARL. Indeed, thirty-two of the thirty-eight faculty interviewed held their terminal degrees from ARL member institutions. Among the thirty-one institutions represented, doctoral pedigrees include Harvard University; M.I.T.; UCLA; the University of California, Berkeley; Johns Hopkins University; the University of North Carolina; the University of Texas; and the University of Virginia.

As a result, it should not be surprising that they should share a very common set of expectations as to what constitutes quality in an academic library. It could also be posited that, through a mentoring relationship with graduate students and by transmitting their own values to the undergraduates from the classroom lectern, those perspectives would be shared in large measure throughout the academic community. A rigorous defense of deep comprehensive collections and responsive bibliographers was among the values the investigators expected to encounter. While in the main those expectations were affirmed, other expectations also surfaced.

As might be expected, many faculty have worked in several universities en route to their current jobs. Their impressions of quality library service are determined not only by their years of graduate study—the period of most intense use—and the resources of their home institutions, but by the other stops along the way. In fact, when measuring the quality of library collections, or setting the standard for exemplary attentive service, faculty often recall experiences at places other than their current place of employment. Experiences were not limited to North American universities. In setting their standards for service expectations, faculty recall their tenure at such universities as Albert Ludwigs University in Freiburg (II10), the Eberhard Karls University in Tübingen (II2, 144), Ulm University (II8), and Trinity College in Dublin (II59), to name a few.

As leading researchers in their fields, they have necessarily made use of national libraries and special collections in North America and abroad. The Library of Congress headed the list of most frequent stops (II2:1, II9:1), with the National Library of Medicine frequently mentioned (II2:1). But
the use of national libraries includes as well the Bibliothèque Nationale de France (17:1), the British Library (18:16), and the Archivio Segreto Vaticano (19).

From the sixty interviews conducted (see Appendix), thirty of those richest in content were selected to provide the texture and substance of the following analysis. Thirty interviews were considered sufficient to cover the range of issues among research library users. The remaining interviews can be used for an independent, stepwise, or split-half reliability check on the results of the analysis to answer the need for confirmability in naturalistic inquiry. The thirty interviews studied were chosen to represent the widely diverse population of users of research libraries and thus included sixteen males and fourteen females, of whom nine were full professors, five associate professors, five assistant professors, six graduate students, and six undergraduates.

The following analysis is framed in three parts. The first section, “Who am I?—the User” investigates the constituents of the research library of the twenty-first century and offers defining characteristics of the user. The second section, “What is the Library?” examines the dimensions of library service quality that constituents identify as important. The domains of service affect, reliability, ubiquity of access, and collection adequacy are investigated. The final section, “What is It that I want from the Library?” addresses the complex role that library as place plays in the minds of users and its relationship to the general construct of library service quality.

I. Who am I—the User?

I want to be confident and self-reliant in using a library. When I have questions, I want to be treated with dignity.

A major focus of library service quality—as central to the issue as the library itself—is the user. Interviews established that the user expects the library to provide service with respect for users having various levels of expertise and sensitivities, and to promote wide and easy access to a broad spectrum of informational resources in traditional local library collections and access to electronic resources and remote print collections. How is the user characterized?

First, the user of research library collections, whether an undergraduate, graduate student, or faculty member, wants to be self-reliant and confident in navigating the library. Self-reliance is built in many ways, but in the interviews two means dominated the responses. Self-reliant users are forged formally through bibliographic instruction and informally through mentoring relationships of faculty and librarians with students and through trial and error. Albeit inefficient, independent trial and error is, indeed, the most commonly followed strategy to building self-confident user behavior.
Interviews revealed primarily two behavioral strategies for creating self-reliance. The first is exemplified in users who interact with librarians with the goal of building their own information gathering skills. Once equipped with a skill set in navigating the library, often a minimal set, their goal is to venture off on their own as quickly as possible to find what they need. These users interact with librarians on a seldom, and only as needed, basis. Repeatedly, users reiterated that they do not want to bother librarians whom they see as very busy people. Other library users do not want to display their own ignorance. Some users also feel that the encounter with a generalist librarian is inadequate for their needs. A specialist librarian who shares the discipline vernacular with a user is the only assistance that can be trusted to yield results. There is a spectrum of user approaches to librarians from the wary and sometimes tentative undergraduate to the confident faculty member; ultimately, all seek self-reliance.

A second method to self-reliance also emerged from the interviews. Some users seek out a trusted librarian colleague to establish a point of contact for assistance. These users develop an enduring relationship with a librarian and are confident that, when they are in need, assistance will be delivered. This group has a goal of self-reliance in navigating the labyrinthine information universe on their own terms. However, these terms include a librarian interface in some circumstances. They differ from the previous group in that they do not feel a need to do everything themselves. These users still want to be confident in finding what they need or in obtaining the service they desire. To be self-reliant within the information-gathering process, proficiency may be sought through an intermediary—a trusted established human point of contact within the library.

Self-Reliance

Most faculty are very comfortable in finding the information they need on their own. One assistant speech professor reported “97% of the time I do my own search . . . . I often find my searches are much more fruitful than letting somebody else do it” (I12:16-17;176-217[S7R]). But how did this professor achieve this level of self-reliance? “[T]hey [the library] had someone you could hire to do the searches as I do them. That was critical . . . .” (I12:12:265-268(SR8)). More than once an interviewee described this learning experience, quoting the adage, “teach me to fish and I will feed myself for my whole life” (I55:286-299:[SR68]). On those occasions when a faculty member has to ask a question, he/she will often want assistance only to get started, “Well, that’s the other side of it. Sometimes I just want them to get me pointed a little bit” (I49:34:539-548[SR52]). For faculty, the availability of Internet resources builds independence as well, but the librarian can still maintain a role. One professor commented: “Well, first thing, I would turn to the best search engines that are out there.
That's not a person so much as an entity. In this sense, librarians are search engines [just] with a different interface” (I56:14:145-154[SRI]).

The same drive for self-reliance is evident in the graduate student cohort as well. One graduate student commented: “By habit, I usually try to be self sufficient. And I've found that I am actually fairly proficient. I usually find what I'm looking for eventually. So I personally tend to ask a librarian things only as a last resort. Part of it, again, is because of this self-sufficiency streak I have” (I37:26:340-343[SR31]).

Undergraduate library users also have a goal of self-reliance in using the library but often hesitate to ask for help to a palpably different degree from faculty and graduate students. A first year undergraduate explained: “I try to teach myself to do that rather than coming up here and asking” (I14:10:130-140[SR9]). Navigating the library system is daunting for many undergraduates. One undergraduate commented, “I think students have a lack of confidence. Students don’t want to look dumb. Probably five times out of ten, when a student goes to ask a librarian something, they’ll say I know this is a really stupid question or I know I should know where to find this book, but .... They always preface it with some sort of self-degrading remark, and I think sometimes students are just too embarrassed to admit what they don’t know” (I51:41:523-528[SR57]). How do undergraduates want to be treated when asking a question? “Not too sentimental ... not too condescending. Well, even a little condescending would be kind of good ... [Like] another human being would go out and show you how to use something to help you out. Not rude comments or anything like that ... about me not knowing how to use it” (I14:9:101-13[SR9]). Often students will not pursue a question: “I figured that if I can’t find it, then I just won’t find it” (I14:19:264-277[SR10]).

Having long understood the drive for self-reliance on the part of users, librarians have traditionally sought to build user skills through bibliographic instruction. The effectiveness of formal bibliographic instruction, particularly of the in-library tour variety, was often questioned by faculty and students: “But people [library staff] have come, they have made overtures. It's not a problem with communication, a lack of people trying to reach out. I'm really surprised and impressed at that. But it's true that I haven't picked up the ball [in library bibliographic instruction] (I9:34:319-324[SR6]). Another professor has long instructed her students in using Medline and would avail herself of the opportunity to have a librarian come into the classroom to teach, but not because she understands the intrinsic value of formal bibliographic instruction: “Because anything that reduces the amount of time I have to spend in instruction frees up time for me to be more productive in the areas I get rated on with my research” (I12:20:244-251[SR8]. An associate professor explained:

I have the feeling they [students] may not have used it [formal library orientation], and I think they may just have been a little too
young for it, too unprepared. They’re brand new at the college and she’s going through stuff that I didn’t even know about how to use . . . these databases and so on. I never really followed up with them [librarians]. They [students] all had to write papers, that’s why we did that. But I’m not sure whether they used any of the services or not . . . . I think the important thing is, at least they knew the library was there, they knew the staff was friendly, and they probably at least felt they knew how to ask questions. And you know really that’s the most important thing, making the students feel comfortable in the library. (I44:28-288:306[S39-40])

Very customized bibliographic instruction woven into the fabric of classroom instruction seems to be more effective in teaching information-seeking skills. One professor explained:

There is almost no literature on how to motivate students to learn how to use libraries. Librarians told me that the typical student here would do this only because they had to. Intrinsic motivations are only going to guide a few people like us [in learning how to use libraries]. The librarians and a couple of real deconstructionist profs are there in libraries . . . they live in libraries . . . . they wish they could have just hooked one up to their veins, and that’s about it. There would be a small percentage who would just do it for intrinsic reasons and everybody else does it because they have to. When they have to and only then . . . . [The] best way to break that wall down doesn’t seem to be going to the library for the orientation, because we are doing that already. That doesn’t seem to have any magic result. But, why don’t we bring librarians into the classroom more and not just for orientations? So I worked out a deal with Mary, who is the bibliographer who does normal orientations. We’d go in and get people familiar with her and do the normal orientations at the beginning of the semester. Then she would come back mid-semester when we had mini-roundtables for the students to pitch their research topic ideas to each other. Mary worked with the students through several sessions. In December, the class asked whether Mary was going to be there for our final project presentations. I didn’t really mean to impose on her time that far . . . . well I floated the invitation to her and she said that she had been thinking about that very thing. So Mary was actually there. So what I’ve done is try to break down the whole idea that the library is a place that you go. It’s a resource that you tap into for the whole idea of answering questions, forming them and answering them, and the librarians aren’t the custodians of anything there. It’s not like you go up to a counter and order your scoop of ice cream, and they dispense it out of a container. They [librarians] are a part of the thinking process; the research is part of the thinking process. (I16:13:165-212[S11-12])

Some users develop self-reliant habits by establishing a collegial working relationship with a trusted library staff point of contact. It was noteworthy that this type of working relationship was often associated with mixed feelings of guilt on the part of the user.
If Joe were to leave . . . I think that it takes somebody on the library staff with a commitment beyond the usual to do it. I'm kind of two minds about this, because (a) it's great, it's fabulous, it's wonderful and (b) I'm probably using, shoot'n up more than my share of the cannon balls here . . . of the library's resources. I'm one of those captains who's constantly shooting off too many guns, ripping up too many sails, and there is a little feeling of guilt about that, but it seems to me that's an extremely important thing . . . that librarians really have to be involved as much in the learning process [or] they simply [will be reduced] to asking "What may I help you find, or let's take a look at this whole scavenger list that your professor has given you" . . . that kind of role, like waiting behind the counter for people to show up. (116:15:216-233[SR12-13])

Another professor commented on her librarian point of contact: "[She was] always dashing about in a bit of a whirlwind, but she was very useful and very good. She would get things or get back to you or connect you. So, I've gone to her even when I think, my God, I wonder if I'm being lazy" (122:21:187-197[SR20]).

The effectiveness of bibliographic instruction in building self-reliant user behavior is seen as a function of timing and need. An undergraduate student mentioned, "I feel that libraries like this can be pretty daunting to freshmen, and they become less so through people's academic careers when they actually have to use them and negotiate them. And when you have to is when you actually do, because then you're motivated to do it, and you know it's not going to necessarily be the easiest thing in the world and you're gonna have to sometimes be assertive to get what you need" (139:30:491-496[SR34]).

II. What is the Library?

In response to a question about the relationship between undergraduates and those who dispense information services in research libraries, one person replied "The way that librarians handle these people is a big factor." The interview was with a journalism professor, and the talk had turned to the impact of technologies on his profession and upon libraries. Always complex, he felt research libraries had become even more intricate and imposing to young students: "Now that's not to say that we need to send the librarians to charm school, just that they are really great at handling these people as they come in, like a good retail sales person" (116:23:447-463 [AA13]). A recurrent theme throughout the interviews, his observation recalled the SERVQUAL dimension of empathy—the caring individualized attention a firm provides its customers (Parasuraman et al., 1985). That value clearly has its counterpart in the research library.

His choice of a retail metaphor was coincidental. Unlike several other interview subjects, he had no prior exposure to the literature of service quality. Nor had he intended to diminish the professional skills of the librarians as, repeatedly, during the course of the interview, he underscored
the critical role of librarians in the process of critical inquiry. But he was not the only one to recall the importance of a caring relationship across a service counter between a library employee on one side and a library user on the other. A student worker understood the importance of always connecting a user with someone in the library department able to answer a question, to ensure “they [users] are not walking away feeling like they did not get the help they need” (I39:29:455-464 [A41]). A young undergraduate half a continent away had a similar assessment. When he had worked in the library, he recalled, his “supervisor made it very clear that customer service was the most important thing to work on. That was important, to be helpful. That is why we’re here” (I60:8:79-83 [A77]). But, he continued, there were important differences from the retail sector. “I view it [the library] more as a bureaucracy,” he said, comparing his experiences. “I have more authority in a retail setting of what I can do for customers because it is a service and the goal is to make a sale. Whereas with a bureaucracy . . . it’s not our product at the desk” (I60:8:4-99 [A78]).

Indeed, the problem may be that the student employee—so frequently encountered by the user—has little sense of ownership of the library mission (I35:26:471-485 [A31]). “A lot of the people you deal with are students that are working for extremely low pay because there are no jobs in this area,” said one graduate student. So, you have the basic graduate students and undergraduate students that are making six to ten dollars an hour and . . . that’s the kind of service you get . . . . You can ask one person and get nothing and you can ask another person and get great help” (I27:18:288-296 [A20]; I27:34:562-577 [A21]).

Several interviewees stressed that a caring, empathetic response was especially important for undergraduates. “They’re really scared just to walk in that door,” said one full professor. “Some students just have a block about doing that” (I28:39:526-521 [A25]). An undergraduate was one of several interviewees affirming that point of view: “Undergraduates going to an institution that is prestigious feel embarrassed if they don’t know how to use something like the research library, and librarians can seem sort of stand-offish” (I50:6:75-80 [A56]; see also I51:44:530-552 [A59-60]).

“It becomes less important as you go up the higher education ladder” was the general assessment (I2:17:48-51 [A1]). One observer offered a perceptive explanation for this dynamic, contrasting the library experience with the classroom. “Once you’ve broken the ice in the classroom,” he suggested, “that’s everybody’s turf . . . . I don’t walk into a class thinking ‘this is my classroom.’ . . . I have a role to play and I hope the students feel the same. You are on foreign turf when you go [into the library] . . . . There are some demeanor issues that are important, that librarians should understand as faculty intuitively do” (I16:25:484-491 [A14]; I16:32:577-590 [A15]).
For impressionable undergraduates, disconfirming acts can be especially problematic and can have an impact on perceptions of service quality far out of proportion to the frequency of their occurrence. One associate professor, generally favorably disposed to the level of library service at his university, offered one example of the ripple effect of a negative encounter. The incident involved a keyword search he recommended a student make on a certain database. Unfortunately, he recalled, the librarian on duty was unfamiliar with the database, questioned the search and whether the instructor "was at all up on what I was talking about." He continued:

When somebody goes to a staff member of the library and gets told something completely different from what I’ve told them [and] then the staff member questions whether the professor really knows what the hell it is he’s talking about, . . . that can be very damaging to the student especially. . . . That came up while I was chair of the Senate’s Library Committee. ([116:20:412-423 [A13]])

For graduate students, this is less of an issue, suggested another. "A graduate student," she observed, "is an academic in training. To do that you’ve got to seek information-seeking skills or you are in the wrong business. So, clearly, they are becoming more self-reliant in that way, but I think they still need help" ([146:50:616-622 [A51-52]]). For faculty, the situation is much the same. Secure in the command of her discipline, a faculty member is also comfortable about what she does not know. Far more than a student, she is more comfortable saying "I really want to find something out about Japanese and let me tell you the truth: I haven’t worked with this language at all" ([122:20:177-184 [A16]]). The difference in confidence levels can make the expectation of an empathetic reception across the service desk less important.

In a curious way, some of the problem may also stem from perceived differences in the role users assign to librarians versus the role that they routinely accord to staff in retail or other sectors. One empathetic graduate student mused upon the differences in roles of librarians and retail staff. He wished that he could feel his information-seeking behavior was not intrusive:

Anytime that I have been to a reference desk, they are usually fielding multiple phone calls, and typing stuff in, and I feel like a fifth wheel. I sort of try to stand at the side and wait until they are done and by the time they are finished, I feel a little bit sheepish about asking them a question because—it’s like, "wow," they just did all this stuff and now I’m asking them something else. ([P37:33:397-418 [A35]])

That aura of approachability is an issue that emerged several times during the interview process. Perhaps the goal should be that espoused by a West Coast assistant professor:
I would hope that they would be sort of calm and professional. I think the most important thing is that they be people who are highly flexible, tolerant of ambiguity, because it is the unusual question, I think, that reference librarians are approached with, that is actually easy... to categorize... If you approach somebody you want to feel like they were somebody who could calmly and professionally sort of redefine what you bring them in some way that provides useful information back. (I56:27:308-320 [A70])

Knowledge and Courtesy

In the Gap Theory of Service Quality, a dimension closely paralleling empathy is the affective trait, assurance—defined by the SERVQUAL authors as a trait of knowledgeable and courteous employees who have the ability to convey to customers both trust and confidence (Parasuraman et al., 1985). Conversely, when the customer or library user has an expectation of courteous or knowledgeable service disconfirmed, the results can have a very negative effect. “I have not been happy with the quality of service at the Reference Desk,” one young female associate professor observed. “Often they are too engaged in trivial pursuits to help. I am sometimes appalled by their responses to my graduate students” (I2:16:43-46 [A1]).

The instructor, in fact, made little distinction between a retail encounter and an information transaction in the library. “I want to be treated with respect. I want you to be courteous, to look like you know what you are doing and enjoy what you are doing... Don’t get into personal conversations when I am at the desk” (I2:28:92-98; I2:31:104-109 [A2]). A professor at another research institution shared a similar frustration with a librarian who appeared unwilling to go the extra step. Her need was for a recent volume of a journal, she recounted, but “there was nothing beyond 1996, and the librarian... said ‘I don’t know if we have it; go look in the card catalog to see if we have it,’ or something like that. But to me she didn’t follow through on the problem. That’s kind of an incomplete thing. So I guess there is a sense here that people can help you find what they have, but perhaps not go beyond that. They will help you find what’s on the shelf, but not go beyond that... A more knowledgeable bit of help would have helped...” (I9:13:75-86; I9:14:88-96 [A4]). In a faithful echo of the SERVQUAL assurance dimension, she added that those working at the reference desk should be “respectful” and “knowledgeable.” What she was looking for was evidence of “a commitment to following through... Everything can’t be found, but being knowledgeable and being committed to giving what they know. I guess those two things together” (I9:27:251-259 [A5]). Students echoed the same disconfirming experience (I39:10:132-157 [A37]).

One graduate student laid her decision to leave one graduate program for another university squarely at the feet of a librarian:

The personality of the librarian created a lot of institutional problems. So even though [the library] had some good resources there,
you couldn’t access them and he was not interested in helping you to access any other resources you might find within the . . . area. In a very specialized field, if the librarian isn’t willing to give you that first heads up on what resources you have, you’re sunk. So the library was about a sixth of the reason why I left . . . I could never find what I needed and every time I tried to talk to the librarian, he tried to tell me, “go to Russia.” (155:26:286-299 [A67])

Every disconfirming act chronicled during the interview series was counterbalanced by a far larger number of examples of successful service encounters. One instructor summarized her own experiences as follows:

I’ve always been quite impressed, even if they are students, with people working a position. If they don’t know the answer to a question, they know who to refer me to, and that means a lot to me. Nothing is more frustrating than when you’re urgently looking for something and someone says, “Well, I don’t know how to help you, can you come back tomorrow?” But everybody whom I’ve come across, anywhere—in the Main Library, Science Library, Health Sciences—on this campus, they’ve all been quite knowledgeable, and they don’t leave you without some direction.” (112:36:504-513 [A7])

The library user is expecting a “friendly encounter,” observed another. The ideal encounter is with a librarian or staff member “who has suggestions for you” (122:20:177-184 [A16]). One faculty member offered a specific example of how content mastery and demeanor can be combined:

I think demeanor is really important and I think sometimes it’s overlooked, sacrificed for content. I brought a group of juniors and seniors over who were writing a senior paper. And it was a combination of demeanor and content. It was not being overwhelmed with so many things that they weren’t sure what the relevance was . . . . Then the utility of these things was made . . . very clear through example and through discussion of what they could be used for. And then the demeanor was very important because the librarian who made the presentation was very accessible, took questions, involved the students after lecturing to them. It was active as opposed to passive learning. It was very effective. And also, [she] made [it] clear that she was a resource that they could continue to use. (141:23:269-288 [A48])

The Margin of Excellence

For the SERVQUAL authors, the third affective construct in the delivery of quality service is responsiveness, or the provision of prompt service and a perception on the part of the customer of the service provider’s ready willingness to help (Parasuraman et al., 1985). Faculty attitudes in this regard were instructive. The great majority of faculty interviewed currently had or could recall successful one-to-one relationships with librarians upon whom they could rely to facilitate their own information-seeking behavior. But when asked to assess librarians, as a group, as a profession, they were often less charitable. One senior professor spoke of a huge gulf—a “temperament breach”—between librarians and their users.
(I4:8:16-22 [A3]); another spoke of the “walls” between the librarians and “the rest of the academy” (I16:16:256-284 [A12]). It is, the former insisted, a “conservative, circle-the-wagons mentality” that had dire implications for service quality. “Librarians don’t go to faculty offices,” he continued. “Librarians won’t bring their works in progress to faculty. They want you to validate conclusions they have reached. They have a huge contempt for faculty knowledge” (I4:8:16-22; I4:9:24-32 [A3]). His own way of coping with this dynamic, he explained, was to “walk behind the fences” the librarians had erected and to engage those who could be useful to him. “You discover what you expect to find,” he concluded simply (I4:9:24-32 [A3]). From the librarian who exhibited a casual disinterest in the availability of a recent journal title needed by a professor, a simple gesture of “just let me check and see if we have that” would have sufficed, she said. “That would have been very helpful at that point, and it would have made [the encounter] satisfactory for me” (I9:14:88-96 [A4]).

Again, for every instance of a service encounter negatively perceived by the user, there were many more confirming examples (I47:12:131-154 [UA 50]). Where the uncaring librarian mentioned previously failed to go the extra mile, another faculty member used as an example of responsiveness an e-mail she received three days after visiting the reference desk. A much-needed article was finally obtained after a journal reference was discovered to be mistitled and the correct one identified (45:15:177-184 [A47-48]). Another instructor commented upon the commitment to service quality excellence at her institution. “I think this school has demonstrated such interest in being competent, in providing the best possible services, and that has been my impression of the library system here . . . . I think this system here is really unique in that way. I’ve never anywhere else had that kind of interaction with the people running the library system” (I12:37:520-533 [A7]).

In sharp counterpoint to the perceptions of the professor who vented his frustrations over librarians’ reluctance to approach the faculty, another recounted a collaborative effort of faculty and librarians on his campus to bring the latter into the classroom as partners in the learning process. Over time, the process evolved into a semester-long interactive process involving students, instructor, and librarian. In what the instructor called his “mini round table,” the librarian would join in sessions with the students where research projects were shared. The students not only benefitted from the librarian’s familiarity with databases and sources, but were able to interact with her to reap the benefits of trial search inquiries she performed on their behalf before setting off on their own critical inquiry. So productive was the learning process, he recounted, that when the time came at the end of the semester for the students to share their research results with him and their colleagues, the class requested that the librar-
ian, a key partner in their endeavors, attend the final presentations as well (I16:14:200-212 [A11]).

For the faculty member who has spent a career mastering a discipline, the role of the subject specialist is also vital. Even for the most senior professor, whose command of a discipline is shared by only a few closely-networked colleagues around the world, there are trusted librarians with whom a close working relationship is vital. One senior history professor summed up the situation as follows:

I think it’s very important for my colleagues in the library to understand the kinds of questions that we ask. That they understand how we work with documents, how we work with sources. I think it’s very important that they have at least a familiarity with the languages that we use even if they don’t have any particular expertise in them. I think it’s not only important for them in the direct ways that they help us through collection development or through collection acquisition [but that] they also sense that they are advocates too. They need to understand how we work in order to make sure when we are not there that library policy is consistent with our goals and the goals that we set for our students. (I54:22:147-160[A62])

For herself, added one associate professor, librarians are “far and away the single most important sources for me about what to look at and where to go to find it. And they are really the gatekeepers of knowledge. And so... the human element is absolutely the most important in terms of where I go and what I look at” (I41:27:333-359 [A44]).

Comprehensive Collections

As it has been since the great library at Alexandria, the research libraries of the world are symbols of inestimable importance to the life of the mind. It should come as little surprise that no discussion of library service quality with its primary clientele would fail to highlight the issues of library resources and their interaction with them. One senior professor of history observed that research libraries remain at the center of the intellectual process:

It used to be that we could send [students] to the library and we could assume that they were mostly coming into contact with works published by academic presses, the university presses, or by rigorous commercial presses. I think that is still the case, but so many of them have come to think of the web as a resource... [They] need to be taught that much of what exists on the web is the product of... entities whose standards for research and publication are not always equivalent to those that my colleagues and I abide by. So I let them know that there is such a thing as a juried publication. [These publications] insist that anything that gets published is read by two, sometimes three, four, or more specialists in the field and that when a book is published, it’s not error-free but it has certainly been read and critically assessed and revised according to critical standards. (I54:31:238-255 [A62-63])
For the great majority of faculty, the research library is still a central place, and comprehensive collections are still required by most to fulfill their instructional and research responsibilities (I41:14:165-174 [C17]). This section assesses the changing definition of comprehensive collections in research libraries, the roles of technology in the life of students and faculty, and the implications of a steadily expanding information universe.

The Importance of Comprehensive Collections

The same professor who so eloquently explained his decision to inform his students of the differences between the collections housed in the research library and the information encountered on the Internet also had a clear appreciation of the uniqueness of North American collections. He always enjoys, he related, showing his European counterparts the richness of his home university holdings:

One of the things I always make sure I do is to take them to the library where they can see the open stacks, where they can see how large the collection actually is, where they can see in fact that we have the equivalent of the entire Congressional Record for the French National Assembly going back to 1789 and if one wanted one could pick one of these lovely leather bound volumes up, take it over to the copy machine, crack the spine and, for a nickel, photocopy to the heart’s content. And this just brings tears to them because they have nothing like this . . . I think one of the things I love about academic life in the United States is that, as a culture, as an academic culture, we tend to appreciate the extraordinary importance of libraries and the life of the mind. That’s such a tremendous resource and such a precious resource and—in my experience—such a unique resource in terms of the western world. It’s something we need to preserve and cultivate. (I54:34:281-299 [A63])

For most faculty, the older research libraries that have benefitted from sustained investment over time are still the most satisfactory, for that ensures an unbroken access into the deep past (I2:5:16-29; I12:9:97-104; I12:10:106-113 [C4]). One professor spoke respectfully of the role of his predecessors in building the collections he used and how, now, he “had taken over from them” the responsibility for their future development (I54:14:70-75 [C27]). Journals were a particular focus (I22:12:79-80 [C9]). One professor recalled fondly her experiences at one of North America’s largest research collections, where she was almost always able to find the journals she needed, and where impasse was taken as a personal affront by the librarians. “People cared if they didn’t have it,” she observed. “It was kind of like, ‘Oh!’, because there was this assumption that ‘Oh, golly, we don’t have that?’” (I9:38:357-368 [C3]). For the most part, deep rich collections of books and journals are uniformly valued and often play a fundamental role in a professor’s choice of positions (I12:5:16-29 [C4]; I12:14:148-152 [C5]). For most, deep collections are key to their academic
success. Graduate students and faculty generally agreed that it was difficult to imagine succeeding in environments where the comprehensive collections with which they were familiar were unavailable. A senior history professor made clear that his success could be attributed to the library:

I sometimes wonder about colleagues in other places. We meet at conferences all the time and . . . I wonder how they do it. I sense that if I were in an institution that didn’t have the rich collections as this library and the very effective staff members that this library has that I would imperceptibly slip in my discipline . . . . And I think I provide a qualitatively different and qualitatively better experience for my students because I am a research scholar and what my students get depends heavily on the work other people have done, what they’ve written, what they’ve published. (I54:20:113-134 [C28])

One young music professor volunteered that her most recent book could not have been written at her previous institution. The depth of the local collections and the richness of other holdings in her geographical area created the possibility of publication (I47:29:355-360 [C21]). A graduate student echoed the sentiments of the professor above when she talked of the importance of browsing the holdings related to her dissertation research (I50:21:267-278 [C24]; I18:44:453-462 [UA 19]). Even a business professor who, for the most part, conducted his research using World Wide Web resources, found the retrospective collections of his library to be essential: “All the models I am working on are things that were invented in the 20’s through the 60’s” he said, “and they have been forgotten by today’s academics and industry people . . . . In all fairness, the only time . . . I’ll be using the library and actually coming here and perusing shelves is looking for stuff [older print materials] like that” (I52:25:366-382 [C26]).

Only one professor brushed aside the importance of comprehensive collections, observing that even the most extensive collections were incomplete and that he was able to pursue his interests from the local holdings without too much reliance on interlibrary loan (I4:133:45-48 [C3]).

Budgetary Issues

The issue of sustained investment over time is not lost on educated library users. One faculty member contrasted her experiences at another research university with her more constrained present experiences. Formerly, she recalled, she was able to count on the availability of materials whether they were old or current. “You could tell that things were being acquired steadily,” she said (I9:9:45-48 [C3]). Soon after her arrival at her current university, she became disappointed in the depth of library holdings in her field. “There was a lot of talk about budget cuts and cutting back on journals. And that left a lasting impression . . . that there were nice people in the library, but they couldn’t do anything because they didn’t have much money. . . . There’s been an implicit assumption on my part that, however nice they were, they were powerless in the situation”
(I9:493-500 [C4]). Others were more understanding: “I really appreciate the tight budgets the library is under and, the more that I serve on the senate library committee, the more keenly I’m made aware of the fact that funds just aren’t keeping track in any real way with what we need to do” observed one full professor (I28:2:306-309 [C12]).

Almost without exception, faculty and graduate students had come to understand the costs of procuring library materials, especially the rising costs of journal titles. Nevertheless, the fight for the retention of current journals and the acquisition of missing titles was high on many lists (I1:36:202-206 [C2]; I2:37:152-155 [C3]; I9:38:357-368 [C3]). One professor commented on his own university’s commitments in the face of adversity:

You talked about great libraries versus second-tier libraries and my sense is that there is a kind of subliminal boost that you get from knowing that the university cares enough about this sort of stuff to go beyond the bare minimum of what you could get away with . . . . And the fact that the stuff is here and easily accessible can lead to serendipitous discoveries . . . . I think one has to pay some attention to the value-added aspects of going overboard, of providing more than the bare minimum. (I46:54:662-681 [C20])

The technological revolution, another added, was changing the face of libraries, redefining roles, changing the way collection development worked, increasing the need for costly computing. As a result, he argued, “these are exactly the wrong years for library budgets to be cut. These are the years when we need to be investing in libraries, expanding library roles . . . . and to make sure the budgets expand commensurately” (I54:59:548-555 [C30]).

**Ability to Influence Collections**

Equally important to sustained investment over time that assures the deep rich collections necessary for research is the ability to influence the ongoing shape of library holdings (I2:36:143-147 [UA5]). One professor of philosophy placed these two issues in perspective:

I shape the collections a lot . . . . Even though it is a big library [it] has had its up and down periods. [There was] a period in the 60’s and 70’s when they didn’t have so much money and the collections are thin in those years . . . . Nobody was paying attention to philosophy for a period of years back then. So yeah, I work closely with our bibliographer and with the rare books guy . . . . I send them stuff all the time. And they give me the impression that they have the money to respond. (I49:40:43:586-621 [C22-23])

Where collections are deep, access by other means becomes acceptable and helps to define the quality of the library (I56:6:45-60 [C32]). “I can’t think of a document or book that’s been critical to my research that I haven’t been able to track down or have access to in some way,” recalled
a distinguished professor (I28:25:338-341 [C12]). The improvement of
interlibrary loan in recent years has likely reduced the stress somewhat,
but does not completely compensate for thin collections (I50:21:267-278
[C24]; I49:41:595-599 [C23]). "I have had history and sociology of science
graduate students tell me to check a school’s library before you enroll in a
Ph.D. program," said one graduate student, "because they often have to
use interlibrary loan to get stuff" (I51:46:555-571 [C25]).

The Future Role of Electronic Access and Its Relationship to Print

To be sure, some members of the higher education community con-
tinue to live in the primarily print world with which they are comfortably
familiar (I29:33:315-337 [C13]). However, for many, the issue now is ac-
cess. In the minds of most faculty, the great libraries are those that are able
to ensure timely access to information in their respective disciplines with-
out regard to format (I12:9:97-104, I12:10:106-113 [C4]). Access, however,
is not a mere substitution of electronic versions for print but rather the
delivery of information when needed, wherever needed, in the medium
of choice.

Even the most devout defenders of print recognize the relentless in-
cursion of electronic text into scholarship. While many embrace it, others
view the development more cautiously (I54:23:160-173 [C28]). One pro-
pressor shared her own anxieties:

We’re in the midst of this enormous, really revolutionary transition
to electronic communication. But I think it’s really, at this point, a
very incomplete revolution. We’re still very much . . . in the sort of
preliminary stages of the transition. And as an instructor and also as
someone who uses electronic resources in my research, I am pain-
fully aware of how uneven both people’s knowledge and usage and
access to this stuff is. (I41:1:36-41 [C15])

Others have embraced the new technologies wholesale. One senior
professor observed that "over time, my own library use has become in-
creasingly electronic . . . . Something has to be really vital for me to look
for it physically nowadays. I can usually satisfy my lust for indulgence with
full text online sources" (I46:9:58-72 [C19]). Another professor catego-
rized the modern online public access catalog (OPAC)—with its accurate
view of local collections—and OCLC World Cat—that "gives me a virtual
collection that is the collection of North America that isn’t institution
specific"—as the two most important electronic developments for him,
followed closely by the indexes of the periodical literature (I54:26-29:208-
224 [C29]).

Ubiquity and Ease of Access

"You don’t want anything until you really need it." With these words,
a young assistant professor expressed the expectations of most of those
interviewed regarding the libraries on their respective campuses (I45:19:231-240). Deep comprehensive collections in libraries with extensive hours and reliable catalogs have been the means through which research libraries have traditionally met those expectations (I12:9:97-104 [UA 10]). The technological revolution of the past decade represents something of a double-edged sword. On the one hand, the technologies permit research libraries to address the needs of their communities in new and innovative ways. On the other hand, the possibilities introduced by the information technologies contribute to a ratcheting up of user expectations while introducing a new set of reliability issues that inevitably impact upon service quality. One senior professor personalized the situation that many agreed they confront:

In those days, when there was no choice, people made regular trips to the library. It was part of your daily or weekly [routine]. You went in and you looked at the current journals and you scanned the tables of contents, or people did Current Contents and things like that. So it was actually less disruptive because you had to do it all the time. Now that I hardly ever go, . . . I have to think about where I’m going to be and why I’m going to be there. It’s not something I would really expect to do on a regular basis. (I46:25:316-323 [UA 47])

Half a continent away, an associate professor expressed the same frustrations on the online side. Whenever he or his students encounter electronic alternatives to print, they must learn whether the online offering faithfully replicates the information in the original and whether it spans the historical offerings of the original or only of the most recent decades. “I think for students that’s a problem,” he said. “A lot of them think ‘I’ve searched this online; that’s all I need to do!'” (I58:44:371-386 [UA 77]).

The interviews revealed that, while many people cared deeply for, and evinced a preference for, printed materials, the electronic alternatives were increasingly impacting information-seeking behavior. Full-text electronic resources, database accessibility at the desktop, and improved responsiveness of interlibrary lending transactions were all things that users considered in evaluating access to information (I46:10:74-95 [UA 45]). “If I could have the option of printing it off for storage, such as with an electronic document, so much the better. To me, that’s the ideal” (I12:13:140-146 [UA10]). “Collections,” it appears, have taken on a new meaning, with JSTOR occupying a place as significant to many as bound journals on the shelf (I49:21:347-361 [UA 53]). One scientist recounted her experiences at a former institution where canceled journals were replaced by electronic document delivery that generally was fulfilled within the hour. This ability to obtain faxed copies so quickly in lieu of the originals she described as “paradise” (I18:11:55-64).
HOURS OF OPERATION AND BRANCH LIBRARIES

Ubiquity and ease of access require that libraries provide convenient hours of operation at both main and branch libraries. Of course, the ideal goal would be that libraries "would be open 24-hours a day, . . . seven days a week" (I1:22:160-162 [UA2]). For many faculty, however, the electronic access to the desktop and document delivery to the office have made that less important. Increasingly, access to the physical space seems to be a graduate and undergraduate issue (I1:43:300-311 [UA3-4]). Indeed, the desire for extended hours was usually expressed in terms of student needs (I2:23:2-76 [UA4]; 19:10:53-67 [UA7]; I12:39:591-595 [UA12]; 146:38:495-500 [UA48]), many of whom made use of library study facilities into the early morning hours (I14:22:925-947 [UA19]). "They won't necessarily have access from home," observed one scientist of her students. "They won't necessarily have access from their own computer address on campus, so they will have to go to the library to have access . . . " (I18:53:539-544 [UA30]).

As a rule, libraries will adjust their hours during intersession and holiday periods to the lower volume of use. Unfortunately, those budget-saving decisions are not always well-received by those who would like to make heavy use of the libraries in off-peak periods (I49:39:582-584 [UA54]; I50:28:380-391 [UA58]; I58:66:670-691 [UA78]). "The problem is that when the semester is in you're usually really full. You're up to here with marking and so on. It's when that's all finished that you say 'now I am going to find out what people are doing' or read up on the last issue of this or whatever and it's closed" (I22:49:695-709 [UA23-24]). Another senior professor expressed the same sentiment, but gave his current institution high marks for being open "when I have the free time to spend in the library" (I29:46:548-563 [UA30]). Reduced hours of specialized service points, such as special collections and maps, was also a concern of users (I50:36:531-534 [UA59]; I55:32:390-399 [A68]). In some libraries, certain service desks may be closed or staffing may be severely curtailed during periods of lighter use. As one annoyed graduate student observed, "I teach at 8:30 in the morning. I take classes myself. By the time I get around to research, it tends to be around five o'clock in the afternoon. The bulk of my research is done between 5 P.M. and 10 P.M. And the Slavic office is closed" (I55:32:390-399 [UA71]).

One subject on which there was wide division was the issue of branch libraries. All books in one location was one graduate student's definition of ubiquity of access (I37:15:211-218 [UA33]). Adherents of branch libraries tended to be found among those whose disciplines were traditionally defined and who tended to have experienced specialized collections and dedicated staff in their doctoral preparation or early career development (I14:10:40-42 [UA5]; I12:5:16-29 [UA9]). Those who found branch libraries an impediment to their research activity largely came from the
more interdisciplinary fields or had little experience with branch libraries in their formative educational experiences (I18:60:593-599 [UA21]). Most seemed to accept the logic inherent in branch libraries and planned their research accordingly. "It seems to me, actually, impractical to feature having everything under one roof. I mean look at the size of this institution. . . . I think it absolutely depends upon the size of the institution" (I28:34:415-427 [UA 27]). In the end, confessed the graduate student who yearned for a simpler world, it was necessary to accept the distributed research library: "I just use what I can get. And the way that libraries are structured and all the campuses I’ve been to, it involves going to lots of different libraries and using lots of different libraries and lots of different services" (I37:49:585-588 [UA 94]).

**INTERLIBRARY LOAN AND DOCUMENT DELIVERY**

It appears that most graduate students and faculty are willing to pace their research efforts, working on available materials from local collections while inserting loaned materials as they become available (I27:25:381-389 [UA25]; I47:6:51-65 [UA 48]). For the most part, interlibrary loan is now seen as an acceptable and important component of the research process (I29:50:532-534 [UA 29]; I46:34:435-465 [UA 47]; I50:20:254-260 [UA 57]; I54:16:80-87 [UA 66]). The standard for delivery of a requested interlibrary loan that most would seem to find acceptable was one week, with some provision for more rapid turnaround in priority cases (I1:10:40-41 [UA2]; I2:24:78-83 [UA4]; I12:13:140-146 [UA10]; I22:32:320-342 [UA22]; I45:9:98-110 [UA 41]).

"The service is just terrific," observed one senior professor of history of ILL service at his university. "I am amazed by the speed in which most of these things appear. Interlibrary loan . . . is just superb. I have no complaints about the library at all" (I44:11; 15:96-99, 110-119 [UA 40]). One professor was so impressed with the improvements in ILL in recent years that he said he now finds himself requesting things only when he anticipates delivery will coincide with cycles of the school year when he can use them effectively (I54:45:390-405 [UA 69]). An interesting side issue, worthy of further investigation, is the possible inefficiency inherent in the interlibrary loan process. As one graduate student observed, whereas the browsing of physical collections allows her to cull unwanted materials, she is unable to do that with her interlibrary loan requests: "I would have to request fifty items that would all take seven to ten days to arrive, half of them I would probably send back thirty seconds after I looked at them" (I50:22:272-275 [UA 57-58]).

Document delivery also has a place. One campus received praise in several quarters for its fee-based delivery program that allowed delivery of locally-owned or electronically procured materials to the faculty office (I28:20:277 284 [UA 26]; I29:45:522 539 [UA 29]). The availability
of books on demand, giving the user a bound copy to retain, is a recent innovation that one faculty member singled out for special praise (I49:50:726-733 [UA 55]). Observations about shortcomings are limited to lengthy wait times, the breakdown of “rush” processes, and the poor quality of materials delivered by fax (I12:25:302-308 [UA11]; I37:54:622-631 [UA 34-35]). One alternative to institutional interlibrary loan is the reliance upon one’s own informal networks. Networking often arises in response to perceived shortcomings in the local ability to provide information in a timely manner, either through in-place collections or document delivery. But sometimes it serves to complement formal library services that are viewed to be working well. One chemistry professor related how, if he really needed something quickly that was unavailable locally, he would ask his staff to contact chemistry colleagues at nearby institutions and arrange for a faxed copy. In that fashion he could count on having the needed item in a couple of days (I1:9:32-34 [UA2]). Another scientist revealed that, if she could not find material on the shelf, or was unwilling to pay the service charges levied by the library, she would “call a colleague at [another institution] and say ‘would you please print it out and send to me?’ Or call a colleague in Germany and [ask] ‘can you fax this to me?’” (I18:34:304-517 [UA18]).

The Role of the Library Web Page

One of the important advances in facilitating access to library information is the role of the library Web page. As one senior professor observed, “over time my own library use has become increasingly electronic so that the amount of time I actually spend in the physical library is getting smaller and the amount of time I spend at my desk on the web . . . is increasing” (I46:6:7:45-48 [UA 44]). Well-designed Web pages and the search engines made available through them are popular with all types of users. “I have found stuff on that Web page I didn’t know to look for. And it’s easy to navigate through. It feels like they are always upgrading it, improving it. After all, I spend all my time in my office. I don’t have time to leave very often” (I12:34:488-493 [UA 12]). For those engaged in interdisciplinary studies, Web pages help to break down the geographic barriers of branch libraries, centralizing collections bibliographically, and bringing databases and full text to the desktop (I37:10:182-185 [UA 32]; I45:48:576-585 [UA 43-44]; I54:25:204-208 [R28]). Improved remote access through authentication systems that allow faculty and students access from home or while traveling are especially popular: “I appreciate being able to sit at my desk in my office, or even at home, and being able to look through all these things” (I57:12:189-198 [UA 32-31]). Even powerful databases and full-text that are accessed through or mounted on dedicated library workstations are regarded with increasing disfavor. As one professor observed, “a lot of the CD-ROM stuff is so boring because you have to
go into the library to get it and then you do your search and so on. It’s just such a disincentive when you have to do all that” (I22:59:840-843 [UA 24]).

Reliability

The interviews with research library users affirmed the importance of the reliability dimension identified by the SERVQUAL authors. In their research, reliability is defined as the ability to perform a promised service dependably and accurately (Parasuraman et al., 1985). In the world of the research library, there are many aspects of library operations where unreliable services can be viewed as impediments to self-reliant behavior, as barriers to the ubiquity and ease of access that users seem to value so highly. Included in issues of concern over reliability are accurate records, management of collections, and functionality of equipment essential for library use that library users have defined as important. While many of those interviewed praised the reliability of the libraries in these areas, this section—in order to more efficiently make the necessary points—will concentrate on the deficits in functionality or performance.

Accurate Records

An alternative title for this section might be “a library fine is not nearly as bad as a car accident,” a phrase used by one library user to describe a library record-keeping error—overdue materials—that can plague borrowers (I22:42:569-613 [R9]). However, for library users there are several other areas of record-keeping that can impact the information-seeking behavior of users: cataloging accuracy, circulation records (is a book actually on the shelf if the catalog indicates its availability?), recall notices, binding records, and the like. Perhaps the most frequently occurring complaint is the unavailability of books found in the catalog and noted as available (I9:19:156-160 [R2]). “That’s really frustrating,” said one faculty member who acknowledged her own lack of patience. “You look for it, and you think: ‘It says it’s here, and I got the number right, and it’s not there.’ That can be frustrating” (I22:16:170-173 [R7]). Availability of print journals for the period of time they are away at the bindery was an issue for at least one professor, apparently a limitation of the local electronic catalog. He did acknowledge that the increasing availability of current issues in electronic form would diminish the severity of the problem (I1:39:220-235 [R2]). Inaccurate overdue notices also came in for their share of criticism. “I had gotten overdue notices for books that I knew I had turned back in,” said one graduate student. “And it had gotten to be almost a comedy of errors” for which library staff would later apologize (I37:45:530-541 [R17]).

Even in those cases where library records were accurate, an apparent unawareness of user behavior patterns can be a source of irritation. One
faculty member recounted her dissatisfaction with recall notices sent through campus mail during the summer or holiday times. Not only are others deprived of access, she observed but, to evade the fine for non-response, it is necessary "to bring in some kind of documentation that shows you were away on university business. That's not very respectful treatment of faculty" (I9:42:500-511 [R4]). “I have not figured out why,” said another, "if we do everything online [why] there are not generated electronic recall notices as well as paper ones" (I47:36:550-556 [R26]).

Follow-through was also an issue. It is particularly irritating, said one faculty member, to go to the trouble to fill out a search form for a lost or misplaced book and never receive any further communication: "You put a search on a book and it's just gone; it's not reacquired . . . . There's more of a problem of lost books, of books that are gone and nobody knows why and nobody's doing anything about it" (I9:12, 20:62-63, 171-179 [R2-3]). "I put something on reserve," recalled another, "and it didn't show up, and somebody complained. I went back and said I've asked for this to be put on reserve and they had lost the form. So I had to do it again” (I22:28:273-278 [R7]). Sometimes the rules are regarded as so user-unfriendly they constitute an impediment to service:

You either get them copied yourself on machines that basically Moses would have used, or you let this little copy center do it. The copy center can only take payment of cash [or] a check that can only be for twenty dollars or less . . . . For a big copy job like I did for a class the other day, [the cost] was 45 bucks . . . . They would not take a check or a credit card . . . . and there's no parking on this campus so you have to hoof it out to where your car is, and it took me four hours to deal with something like that . . . . They are not trying to sell you something; they are trying NOT to sell you something. (I27:17, 41:273-282, 611-614 [R12-13])

**Equipment**

It seems almost everyone who was interviewed had some anecdote about machine malfunctions that had adversely affected their ability to use library resources. Those complaints included, but were not limited to: photocopy machines, microform readers and reader-printers, and microcomputers (I37:61:687-733 [R19]; I50:49:343-366 [R34]). “I want better, reliable machines," insisted one associate professor. “We have some antiquated photocopy machines. Similarly we have horrible and unreliable microform reader-printers” (I2:32:113-120 [R2]). Unreliable and slow microcomputers, as well as limited numbers, was a complaint frequently encountered (I14:6:77-78 [R5]; I51:21:257-261 [R35]). One faculty member found the numbers of microcomputers in the library to be inadequate and their performance unreliable. “You get things that don't work or you have to wait,” she said. “That's why you use them in your office before coming. You have to wait; there could be a line of people there, or because
the computer will be slow, or won't work or will be stuck on something I don't know" (I22:43:622-646 [R9]). A student, otherwise highly complimentary of his libraries, reserved his fury for the balky networked printers. “Printing is the issue that . . . makes me irate,” he offered. “I would expect that to be high quality, top-notch, so that you don’t have any problems with it. I think that there are three of them out there, and I don’t know how all three of them manage to go down all at once” (I14:25:389-408 [R6]). “I will never, ever, use the [microform] printer,” said another user, “because I’ve never seen one that works right. . . . They don’t have very good upkeep of them” (I37:59:662-668 [R19]).

One professor compared unfavorably the limited number of public microcomputers available for viewing the library’s holdings to the card catalog, with its thousands of drawers accommodating many simultaneous users. Peak periods lead to long queues with the microcomputers. With the old catalog, she said, “as long as you can get to the drawer, you can get it, you can find a place to put it on your knee, and you can find the book and go on” (I9:26:226-243 [R3]). “In modern America,” said another frustrated user, “people don’t like to wait in line . . . for anything. They want the stuff they want . . . NOW” (I27:11:196-207 [R11]).

Online public access catalogs, providing access to local collections and to electronic databases and full-text materials, received much comment. Indeed, for one senior professor, “a good catalog is the only tool that I really need from librarians” (I29:36:354-390 [R14]). Most of the user assessments were positive, but others had things to say about reliability issues. Interestingly, some of the newer catalog software is regarded as functionally inferior to earlier versions (I27:9:159-166 [R10]). “Formats change too much,” observed one faculty member not fully comfortable with the electronic environment (I2:32:113-120 [R2]). Part of the problem is, of course, the level of the user’s information literacy. “The problem with electronic means,” observed one professor, “is they’re too stupid to be integrative. You have to supply all the [information]. You have to ask the right question or you don’t get the right answer” (I46:52:639-656 [R25]). Increasingly, electronic catalogs are regarded as utilities, and any downtime is greeted with hostility. “If you’ve got a paper due and your professor hasn’t had time to mess with you being late, that’s not good” said one graduate student who encountered server failure at a critical juncture. “So, basically, I was unable to get the resources and, by the time they got it back up and I came back, the materials were gone” (I27:10:177-191 [R10]). Another graduate student was critical of the time it takes some of the new systems to back up data, resulting in extended downtime that impeded his access (I37:61:687-733 [R19]). Insufficient numbers of passwords to permit ease of access to high demand databases, whether through library computers or off-site, was another issue cited by users (I16:21:424-431 [R7]).
Management of Collections

Discerning faculty at several institutions noted the problem of reshelving library materials in a timely manner (I12:31:444-449 [R5]). Insufficient attention to stacks management and to inventory and shelf checks was also noted on several occasions (I16:21:424-431 [R7]; I45:40:469-473 [R24]; I51:18,25:248-250, 310-326 [R34-35]). Student workers on campus mentioned that inefficient intra-university document delivery unnecessarily tied up documents in lengthy transit periods (I35:21:388-400 [R16]). “There is a serious delay at the library,” said one full professor, “between when you return a book and when it appears on the shelf, and it’s very hard to locate a book within that twilight zone. And sometimes it appears to take several weeks” (I44:31:409-421 [R22]).

III. What is It that I want from the Library?

The interviews suggested that the user of an academic research library is, in the main, a self-reliant person whose confidence and expertise increase with time. Assessment of library service quality is based on interactions with libraries in several dimensions: affect of service, provision of comprehensive collections, ubiquity and ease of access to information, and reliability. But what of the physical library itself? Does it still have meaning, or is it becoming an anachronism tottering on the brink of irrelevance?

As that question was posed to users, it became apparent that perhaps there were two layered responses to that question. In the first place, users pragmatically still agreed in the value of library as place. In the main, this was a threshold concept: for most users, libraries as physical entities were part of the physical landscape, useful for specific purposes of research and study but otherwise taken largely for granted. Only when libraries fell below that acceptable threshold limit, becoming impediments to self-reliant information-seeking behavior, did physical libraries trigger a disconfirming perception. At the other extreme, however, for many, the library served as symbolic affirmation of the life of the mind, of an intellectual vocation within the academy.

Library as Place

When asked of the relative importance of libraries as place in the current technological setting, an associate professor agreed that they were indeed still important places as learning environments and places of study. But, he suggested, libraries were largely taken for granted until a certain threshold was reached. “I guess you’d call them satisfiers,” he said. “[A]s long as they are not negatives, they won’t be much of a factor. If they are negatives, they are big factors” (I16:28,33:503-535, 596-602 [L4, L5]).

The press of academic business will often drive faculty from their offices in search of more facilitative space (I22:40:489-521 [L6]). The noise and congestion of home or dorm life will likewise drive students to the
library in search of a respite. That is not to say that undergraduates would use university libraries by choice. As one graduate student put it, “most undergraduates, at least at this university, would not come here unless forced to” (I27:511-516 [L8]). Other students corroborated that view (I39:12:179-182 [L14]). Indeed, offered one student, there were emerging attractive alternatives to the academic library: “If you’re looking for a personal book just to read, then I think maybe you would just go out to Barnes and Noble, or go someplace where it seems like it would be a little bit easier instead of going to a big library where there’s . . . millions of books” (I39:13:182-187 [L14]).

Even for undergraduates, however, personal circumstances influence library behavior. As one faculty member observed: “The poorer your situation, the more you need the public spaces to work in. When I was an undergraduate, I spent most of my time in the library, just using it as a study space” (I46:24:293-314 [L19]). And a graduate student added, “I think I use the library less for studying and writing as a grad because I live off campus and because I don’t feel like this is my home base like the way I felt my alma mater [library] was my home base as an undergrad” (I50:18:210-226 [L24]).

Nevertheless, for many students, the physical building is an essential part of academic life. For urban commuting universities especially, libraries play a particularly important role, serving as a home away from home for the length of the academic day (I2:33:124-127 [L1]). As one professor observed of his university:

Because it’s a metropolitan school [it] has a lot of students that use the library for studying . . . . One of the problems that we’ve had here has been high-priced study space. We’ve built floors to hold books and they hold students studying, and it’s probably not the most efficient use of the investment in infrastructure, but it’s essential because so many of the students here commute. Between classes, the library is a convenient study space. (I29:22:209-222 [L10])

For these users, the library building serves as an arena for those issues identified in the ubiquity of access section above.

The demands of users for library space are usually restrained. Libraries above the minimum threshold need only to be “comfortably functional” (I16:28:503-535 [L5]). Probably the expectation threshold is defined by the campus facilities as a whole (I16:28:503-535 [L14]). Disconfirmation likely occurs only when library facilities fall discernibly below norms set by other campus facilities—such as classrooms, dormitories, or cafeterias—or when they fail to meet a specific assigned mission such as the study needs of commuter students (I35:8:219-224 [L10]; I37:38:458-478 [L13]; I55:15:152-168 [L28]). Good lighting (I12:32:467-480 [L2]), comfortable furnishings (I9:25:211-224 [L2]; I37:38:458-478 [L13]), quiet study (I58:68:707-711 [L33]), pleasant ambience (I22:40:489-521 [L6]), and
safety (I58:68:707-711 [L33]) were among the qualities that various users required of a library building. "I wouldn't want to study back there," said one female student, "because it was so dark that I would just feel like I'm all alone in this big library" (I39:22:318-343 [L15]). Diverse study environments, from soft seating to carrels and group study rooms, were also enumerated during interviews (I12:32:467-480 [L2]; I14:5:47-73 [L3]). Adequate signage to ease way-finding was also noted as desirable (I39:11:159-172 [L14]). Adequate numbers of up-to-date computers are also required (I12:33:484-486 [L2]). All he wanted, said one graduate student, was a space "where it's reasonably comfortable. Where I can stay for an hour or two and pore through the journals that I took off the shelves . . . . Or if I brought a laptop with me, that there happens to be an Ethernet jack there that I can plug into. I put a little more stock into creature comforts, I think" (I37:40:484-491 [L13]).

Library as Symbol

Beyond the threshold concept of the library as a place that enables information-seeking behavior of students and faculty alike, there was also in the language of interviewees a recurrent reference to something more, something richer. In some instances, the difference was only a matter of degree; that is, descriptions of favorite libraries were little more than extensions of the threshold concept, much in the way one might describe a favorite restaurant or vacation spot. One faculty member described a Swiss monastic setting where the baroque reading room of the small library was furnished with comfortable worktables and awash in natural light from high windows and skylights. The attentive and knowledgeable staff that attended to her needs only added to the vividness of the recollection (I47:28:414-441 [L21]). Another compared a particularly special place in her main library to the Cathedral of Learning at the University of Pittsburgh (I28:11:117-123 [L9]). "One of my cherished rituals," said one history professor, "is going up the steps and through the gorgeous doors of the library and heading up to the fifth floor to my study. . . . I have my books and I have six million volumes downstairs that are readily available to me in an open stack library that is efficiently operated and a staff that is almost uniformly and consistently responsive to my needs" (I54:15:66-70 [L27]). Still another faculty member offered the vision of the graduate student study room at the university where he earned his doctorate. Far less imposing than the monastic reading room, it was a place where he could work quietly at large tables, surrounded only by other like-minded students. It was, he recalled, a large well-lit room with floor to ceiling windows overlooking a particularly scenic lake (I49:16:251-302 [L23]).

Yet, for others, libraries served as an affirming symbol of the life of the mind and of the vocations that faculty and graduates had chosen as career paths. The symbolic importance of libraries was something that
even undergraduates observed. "It draws on my sense of antiquity," said one pre-professional student. "You have that . . . sense of just being around that many limitless books, that much knowledge" (114:3:33-36 [L2]). A first-year graduate student used the example of the main reading room at New York Public Library: "It’s a beautiful room and it really almost imparts some of the intensity of what a library is all about—huge masses of knowledge . . . " (1127:19:321-326 [L7]). The library as a "contemplative" environment was a term offered by two graduate students, including one disabled student who appreciated safe and accommodating reading and study space (134:12:39-40 [L10]; 137:458-478 [L13]). Observing the access to libraries by all citizens regardless of socioeconomic status, one professor added that, for himself, "there’s a sort of democracy of a library that we have not approached in our political system . . . I think there may be some symbolic [significance] there for people for whom libraries as a place, a physical place of importance as opposed to those who see it as useful as long as they need that place to get information" (158:54, 58:534-539, 563-573 [L32]).

For many faculty, libraries are often an affirmation of a chosen lifestyle. "I grew up in a small college town," said one professor. "As a kid I had free run of the college library. . . . It was my favorite place, and so I have always loved being in the library around books, the excitement of . . . the treasures that are there that are fun for me to check out . . . . Being in the library is just an essential part of being an academic" (129:95-98, 99-101 [L9]). Another faculty member spoke of a library’s "spiritual" aspects: "I really like being in the archives, . . . holding the piece of paper that the person I’m studying actually wrote on . . . . The place itself is an asset, is part of the experience . . . . To sit in the middle of all that knowledge" (141:33:434-451 [L17]). For one scientist, whose own research is now accomplished largely in electronic mode, the library is an affirmation of the purpose of an academic life: "The fact that it is here and easily accessible is really important to me. That’s what a university is about. I could work in a little research lab and do my thing, but I wouldn’t have all this other stuff going on" (146:26:327-341 [L19]). The affirming role that libraries play in the life of the mind is perhaps best summed up by a West Coast history professor who offered the following:

My daily routine involves coming to the university . . . and going directly to my library study. . . . There are people that I see everyday, or that I nod to, or wave to, or smile to, and we all have a sense that we are doing something that is very important and enriching and good for us and for our students . . . . I think even if it were possible, and I’m convinced it is not, . . . to duplicate the collection in some virtual form, that we would still be missing the sense of being part of a shared enterprise in which, as scholars, . . . or as scholars in the making, the library provides. It is one of the great third places between the home and the place of work. (154:12:46:60-66, 325-338 [L26-L29])
Despite the marvels of the technological revolution, the library seems still to have a place in the hearts of most library users.

SUMMARY

Interviews with users of research libraries across North America provided a rich pool of information about their own behaviors, about their perceptions of what a library should provide, and about their interactions with that important resource as they pursued their diverse objectives at their respective universities. Analysis of the interviews revealed a penchant among all users for self-reliant, autonomous, information-seeking behavior. Such behavior was palpably different among various user groups. New undergraduates just learning to navigate the complicated labyrinth that is the modern research library certainly had different expectations regarding how a library should facilitate self-reliance than the full professor, secure in the command of her discipline and its information resources. For users at every level of expertise, the extent to which libraries facilitate self-reliant information-seeking behavior seems to be related to their perceptions of library service quality. The relationships among perceptions, satisfaction, and assessments of quality established by de Ruyter et al. (1997, p. 401)—i.e., that perceptions of quality are the most important indicators of satisfaction—seem to be confirmed qualitatively. A question meriting further investigation is whether successful self-reliant information-seeking behavior is a component of service quality or is the result of service quality. Future rounds of research with the LibQUAL+ instrument may permit investigation of this question.

For users, the research library is expected to work simultaneously on several different levels to facilitate their information-seeking behavior as reflected in Figure 1. In the analysis, the mass of content relating to affective issues is revelatory. Interviewees spent more time expressing their concerns and expectations for the delivery of respectful and caring service than other factors. Critically important were library staff who were informed, courteous, and engaged in their roles as they interacted with users. Users expected to be received with dignity and a solicitous understanding of their needs and their command of the information labyrinth.

While varying with discipline and level of information need, there was universally a respect for comprehensive collections. At a practical level, collections are there to answer information needs. But they also serve as an affirmation of the purpose and mission of the research university and of the life of the mind for which the primary university community has opted. Increasingly, the revolution in information technologies has fostered wide and easy access to information. Rich physical collections require facilities that are open adequate hours, are well-staffed, and are easy to negotiate. Electronically accessible information should be easily available at the desktop, whether at the office, in the home, or in the library.
Document delivery and interlibrary loan are acceptable complements to local access if they are easy to accomplish and rapid in delivery. And, importantly, the library systems that support self-reliant information-seeking behavior should perform reliably. Public catalog records, circulation data, and interlibrary loan transactions should be accurate, free from the errors that spark disconfirming experiences, impact negatively upon satisfaction, and influence assessment of library service quality. Equipment such as photocopiers and microcomputers should be available in adequate numbers and perform as expected when needed.

CONCLUSION

A traveler crossing San Francisco Bay over the Golden Gate bridge moves easily toward a destination almost unaware of the engineering feat that made the journey possible. For the engineers responsible for planning, siting, and constructing a bridge, the details that must be considered are almost endless. The length of the span, the height of clearance for traffic beneath, the number of vehicles per hour, emergency islands for disabled vehicles, the design of toll collections, and the nature of access to and exit from the bridge from neighboring thoroughfares are among the many factors that must be considered by the designers. When the bridge works as the designers intended, the traveler engages the bridge on few, if any, of those dimen-
ensions. If asked to consider the contribution of the bridge to the journey, there would likely be ready acknowledgment that it provided a welcome alternative to a circuitous land route around the bay or a lengthy queue awaiting a ferry. On the other hand, when the bridge fails to meet expectations of a timely and incident-free commute due to mechanical repairs, accidents, traffic snarls, or other factors, then it is reasonable to expect that judgments regarding service quality would be rendered.

And perhaps so it is with the library. It is an essential component of the research university environment. For undergraduate students, graduate students, and faculty alike, the library is supposed to function well across a number of dimensions, enabling them to move self-reliantly in their specific information-seeking behaviors. As the price of the toll is more important for one traveler, and the length of commute more important for another, library users approach the various dimensions of service with differing expectations. When it works well, the library is a place that enters into the consciousness of the user little more than the span over open water enters into the awareness of the traveler; the library is merely an entity that facilitates a more important undertaking. When expectations are not met—whether it be inadequate collections, insufficient hours, or otherwise—perceptions of service quality can be altered.

Yet, simultaneously, a higher order factor may be at work as well. It is unlikely that any traveler, in recalling the idea of a bridge, conjures up the cloverleaf intersection of one interstate highway over another. Rather, the Golden Gate Bridge, Verazanno Narrows, or similar structures as architecturally resplendent as they are functional come to mind as quintessential expressions of bridges doing what they were designed to do.

And so it may be with libraries. The symbol of the library that is called up in the mind’s eye—whether it is the small monastic library with its reading room awash in the afternoon light or the sprawling stacks of a modern research library containing the cumulative works of human accomplishment—is a representation of a structure working as it should in support of the life of the mind. Further, the symbol represents not only one library performing as it should but expresses as well the overarching notion of library service quality that resides in the mind of the beholder. It is these constructs that the LibQUAL+ instrument undertakes to measure.

In the interviewing process, the dimensions of service quality as promulgated by Parasuraman et al. (1988)—responsiveness, reliability, assurance, empathy, and tangibles—did clearly emerge from the user perspective in research libraries. All were domains richly represented in discussions with users regarding their views of what constitutes library service quality. Responsiveness, assurance, and empathy seem to merge into a general need for an affective relationship between the library and its constituents. The definition of a satisfying affective relationship seems to change over an academic lifetime from an undergraduate to a full-fledged professor engaged
in research and teaching. Reliability emerges as a significant component of service quality from the perspective of library users. Services should be provided as promised at the promised time. Communications should be accurate. Intrinsic to the tangibles dimension is the role played by equipment in the modern library. When equipment fails, the library fails as a whole. Users see equipment only as a means to an end, never the end itself. The content is in the conversation, the telephone is only an instrument.

While the dimensions of service quality established by Parasuraman, Zeithaml, and Berry reemerged from the analysis in the library context, three others, perhaps unique to the research library context, were compelling: ubiquity and ease of access to collections, the library as place, subsuming dual concepts of utilitarian space and of the library as a symbol of the intellect and, finally, the overwhelming drive on the part of users to be self-reliant and confident in navigating the information world. Whether self-reliance is a component of library service quality or a result of service quality is unclear and will be investigated in further research. Ubiquity and ease of access, the library as place, and self-reliance emerged from the interviews with users as inescapable elements of the construct of quality library service. As such, these dimensions will be explored in further LibQUAL+ evaluation studies in an iterative process of building and testing theory of library service quality.
APPENDIX

Interviews (I) cited

I1 Professor (Chemistry) (1999)
I2 Associate Professor (English) (1999)
I4 Professor (Engineering) (1999)
I9 Associate Professor (Education) (1999)
I12 Assistant Professor (Speech) (1999)
I14 Undergraduate (Pre-professional) (1999)
I16 Associate Professor (Journalism) (2000)
I18 Assistant Professor (Chemistry) (2000)
I22 Associate Professor (Education) (2000)
I27 Graduate Student (Remote Sensing) (2000)
I28 Professor (Literature) (2000)
I29 Professor (Geography) (2000)
I34 Graduate Student (Education) (2000)
I35 Undergraduates (Political Science/Speech) (2000)
I37 Graduate Student (Health Sciences) (2000)
I39 Undergraduate (Education) (2000)
I41 Assistant Professor (History) (2000)
I44 Professor (Anthropology) (2000)
I45 Graduate Student (Sociology) (2000)
I46 Professor (Biochemistry) (2000)
I47 Assistant Professor (Music) (2000)
I49 Professor (Philosophy) (2000)
I50 Graduate Student (English) (2000)
I51 Undergraduate (History) (2000)
I52 Professor (Marketing) (2000)
I54 Professor (History) (2000)
I55 Graduate Student (Slavic Studies) (2000)
I56 Associate Professor (Medical Education) (2000)
I58 Associate Professor (Communications) (2000)
I60 Undergraduate (Liberal Arts) (2000)
REFERENCES


Psychometric Properties of Scores from the Web-Based LibQUAL+ Study of Perceptions of Library Service Quality

COLLEEN COOK AND BRUCE THOMPSON

ABSTRACT
Based on data provided by 4,407 participants, the present study investigated the psychometric integrity of scores on thirty-four items of the LibQUAL+ evaluation of perceived library quality. The study investigated LibQUAL+ score structure, score reliability, score correlation and concurrent validity coefficients, scale means, and scale standardized norms. If both generic and specialized norms were eventually developed for a large sample of users at ARL institutions, LibQUAL+ norms could then facilitate the ultimate application of LibQUAL+—i.e., identifying areas of potential improvement at a given library, and identifying similar libraries with more favorable profiles whose behavior might then be modeled in pursuit of providing better service to library users.

INTRODUCTION
When most of us visit a surgeon prior to an operation, we probably are concerned about our physician's collection of surgical instruments, diplomas, and reference reprints on surgical procedures. But we probably are concerned about other things in addition to the physician's collections. We care at least as much that our surgeon is focused on our needs, empathic regarding our interests, and dedicated to providing quality service on a consistent basis.

Although users of research libraries may not have life-threatening interests at stake, many library users do feel that service quality is vital to
their abilities to obtain academic degrees or external funding and is critical in creating and disseminating knowledge. Libraries ignore user perceptions of library service quality at their peril. In the modern research library, the singular use of resource-based metrics as the only index of library quality can no longer be regarded as reasonable.

So it is not surprising that libraries confront “pressure . . . to assess the degree to which their services demonstrate criteria of ‘quality.’ . . .” The emphasis on these measures and services provided to library clientele requires librarians . . . not to equate ‘quality’ merely with collection size” (Hernon & McClure, 1990, p. 155). As Nitecki (1996b) noted: “A measure of library quality based solely on collections has become obsolete” (p. 181). As a matter of fact: “In recent years, LIS [Library and Information Science] researchers have drawn on marketing and other literatures to focus attention on expectations and an alternative view of quality, one representing the user’s or customer’s perspective on the services used” (Nitecki & Hernon, 2000, p. 259).

These dynamics led the Association of Research Libraries (ARL) to institute its “New Measures” initiatives. One of the “New Measures” initiatives is the LibQUAL+ study being conducted by ARL and the Texas A&M University Libraries (Cook & Heath, 2000a; Cook, Heath, & Thompson, 2000a). Continuing phases of the LibQUAL+ study are being supported in part by the Fund for the Improvement of Post-Secondary Education (FIPSE).

Briefly, the first iteration of the LibQUAL+ protocol was developed in Spring 2000. The initial phase of the study involved participation with Texas A&M University and twelve additional institutions:

—University of Arizona
—University of California, Santa Barbara
—University of Connecticut
—University of Houston
—University of Kansas
—Michigan State University
—University of Minnesota
—University of Pennsylvania
—University of Pittsburgh
—Virginia Tech
—University of Washington
—York University

In its first phase, the protocol built on the use of the twenty-two items in the well-established SERVQUAL instrument (Parasuraman, Zeithaml, & Berry, 1985, 1994).

The SERVQUAL protocol ostensibly measures perceptions of service tangibles, reliability, responsiveness, assurance, and empathy (Parasuraman, Berry,
& Zeithaml, 1991). Within this model, “only customers judge quality; all other judgments are essentially irrelevant” (Zeithaml, Parasuraman, & Berry, 1990, p. 16).

However, the twenty-two items of SERVQUAL have not yielded the expected five-factor structure when the instrument has been used within the library setting (Cook & Thompson, 2000, in press; Niteki, 1996a). Furthermore, it is critical to ground any evaluation of library service quality within the perceptual schemata evoked by users in their thinking about libraries. Thus, one of the initial steps in the LibQUAL+ inquiry involved conducting in-depth interviews with users at several of the institutions in our study.

The findings of this qualitative work have been described elsewhere (Cook & Heath, 2000b) and resulted in our adding nineteen items to the LibQUAL+ measure used in Spring 2000. The LibQUAL+ items will continue to evolve as the project moves forward. Revisions will continue to be informed by qualitative work plus quantitative analyses such as those reported here.

In short, LibQUAL+ is (1) not SERVQUAL, and (2) not (at least yet), a fixed core of unchanging items. LibQUAL+ is instead grounded in the epistemological view that, in the behavioral sciences, dynamic “theory building and construct measurement are joint bootstrap operations” (Hendrick & Hendrick, 1986, p. 393). The results described here apply to LibQUAL+ in its current form, but the reader is cautioned that this tool will continue to evolve as we collect new iterations of data from an increasing number of users and an even broader array of libraries.

The present inquiry was conducted to address five questions:

1. Can a meaningful and replicable structure underlying user perceptions of library services be identified?
2. Can psychometrically stable scores on LibQUAL+ dimensions be generated?
3. Are scores on different LibQUAL+ dimensions of user perceptions correlated with each other and user overall ratings of library service quality?
4. Do comparisons of LibQUAL+ subscale and total scores across user types suggest that LibQUAL+ scores are psychometrically valid?
5. Can standardized norms potentially be developed to assist librarians in understanding user perceptions of library service quality and targeting areas of needed or desired improvement?

**Method**

**Participants**

Under the guidance of a lead library contact at the twelve institutions, random samples of 600 faculty, 600 graduate students, and 900
undergraduate students were randomly selected at each institution. However, some institutions elected to oversample some respondent groups. Undergraduate students were uniformly oversampled because it was anticipated that their response rates would be disproportionately lower.

For the analyses reported here, the 4,407 participants were divided into two subsamples ($n_1 = 420$; $n_2 = 3,987$) based on LibQUAL+ administration format. Descriptions of the samples are available elsewhere (Cook, Heath, & Thompson, 2000b; Cook, Heath, Thompson, & Thompson, in press–a; Cook, Heath, Thompson, & Thompson, in press–b; Thompson, Cook, & Heath, in press).

**Procedure**

Each randomly selected participant received an e-mail from the library administration at the home campus. This message requested participant assistance in improving library service quality by responding to a brief survey. The participants were informed that the survey was being administered on the Web. The invitation to participate included a hot hyperlink to the Web survey URL. However, participants were also told that they could access the Web site by typing the URL address into the destination box on the Web browser of their preference.

The URL initially sent the participants to the servers at ARL, which then connected the users to servers housing the survey at Texas A&M University. The first page of the survey included a colorized logo furnished by each of the participating universities. Thus, the survey appearance was somewhat individualized for each school.

Prior to responding to the forty-one LibQUAL+ items and some additional items, users were first asked to provide general demographic information. This was done to allow subsequent descriptions of the samples, and a direct explicit comparison of respondents with the institutional profiles of each campus. Cook, Heath, and Thompson (2000) provide a thorough meta-analysis of reasonable response rate expectations and influences in Web-based surveys. In the current political season, when national surveys of 600 voters are (reasonably) generalized to 150 million Americans, it is intriguing that some continue to focus more on sample size than on sample representativeness.

However, as Thompson (2000) emphasized, the representativeness of the respondents is what counts in research. Response rate counts only to the extent that it may (or may not) bear upon sample representativeness. As Krosnick (1999) emphasized in his recent survey of the paper-and-pencil response-rate literature: "But it is not necessarily true that representativeness increases monotonically with increasing response rate . . . . [R]ecent research has shown that surveys with very low response rates can be more accurate than surveys with much higher response rates" (p. 540).
As regards the present participants, Thompson (2000) reported the evidence regarding sample representativeness.

**Instruments**

For each of the forty-one LibQUAL+ items, users were asked to rate their minimum expectations, perceptions, and desires regarding library quality. There were two formats for responding, each associated with one of the two subsamples.

Cook, Heath, Thompson, and Thompson (in press–b) provide more information, including pictures of selected Web pages regarding both response formats. Arnau, Thompson, and Cook (2001) present taxometric analyses suggesting that user perceptions of library quality are continuously scaled.

The subsample of 420 respondents, drawn from York University and Texas A&M University, answered the survey using graphical sliders. For each item, these portray a continuum, and the respondent clicks and drags the slider along the continuum to a given point to communicate ratings. This may have the advantage of providing more precise ratings data.

The subsample of 3,987 respondents provided their ratings data using a “radio button” (hereafter “nonslider”) response format. In this response format, for each item on each rating (i.e., minimum, perceived, and desired), participants were presented nine equally spaced small circles, and they clicked on the appropriate circle for a given response to darken it and thus communicate their ratings. This Web response format is analogous to the use of a nine-point Likert scale. On the average, the participants using the nonslider response format took 71.2 seconds less to complete the survey ($M_{\text{sliders}} = 12.5 \text{ minutes } [SD = 5.0]$; $M_{\text{nonsliders}} = 11.3 \text{ minutes } [SD = 5.5]$).

**Results**

*Dimensions of Perception*

The first analysis investigated the dimensions underlying users’ perceptions of library service quality. This analysis invoked separate principal components analyses of the two subsamples (Hetzel, 1996). The analyses summarized here followed the guidelines presented by Thompson and Daniel (1996).

Based on reliability item analysis and factor analyses for both prior related data sets (Cook & Thompson, 2000) and the present data (Cook, Heath, & Thompson, 2000b), a subset of thirty-four of the original forty-one LibQUAL+ items was retained for further analyses. Retention of a smaller subset of items allows for addition of new items in the next phase of LibQUAL+ item evolution while still maximizing score psychometric integrity.
Gorsuch (1983) has noted that: “A prime use of factor analysis has been in the development of both the theoretical constructs for an area and the operational representatives for the theoretical constructs” (p. 350). In short, “factor analysis is intimately involved with questions of validity. . . . Factor analysis is at the heart of the measurement of psychological constructs” (Nunnally, 1978, pp. 112-13).

The KMO sampling adequacy coefficients for the two analyses were .95 for the slider subsample and .97 for the nonslider data. These values strongly suggest the ample adequacies of the sample sizes for both analyses.

Both the eigenvalue-greater-than-one rule (λ₁ = .98 and λ₂ = .94, respectively) and “scree” plots suggested that four factors should be extracted. Of course, as LibQUAL+ evolves with the addition and deletion of items, in an ongoing renewal process informed by both qualitative work and empirical analysis, the structure measured by the protocol may change as well. The pattern/structure coefficients rotated to the varimax criterion in both analyses are presented in Table 1.

**Score Reliability**

An important element of evaluating score integrity involves the evaluation of score reliability. Coefficient alpha (α) can be computed for this purpose (Reinhardt, 1996). Some researchers deem coefficients of .7 or higher acceptable (Nunnally, 1978, p. 245), though higher values are desired, particularly as scores are applied in making higher stakes judgments (Pedhazur & Schmelkin, 1991).

Item analyses can be conducted as part of such inquiries (Thompson & Levitov, 1985). First, items are expected to “discriminate” between higher and lower scorers on a scale. To evaluate this item behavior, item scores (e.g., here “1” to “9” for the nonslider data) are correlated with scale scores, and reasonably large positive values are desired. However, these “discrimination” or “item-total correlation” coefficients would be inflated if scores on a given item were correlated with scores on a scale to which the given item scores also made a contribution.

For this reason, “corrected” discrimination coefficients are computed by correlating item scores with scores on a given scale computed without using the given item. For example, in the present study, the corrected discrimination coefficient for item 28, a Reliability scale item, was computed by correlating nonslider item 28 scores (ranging from “1” to “9”) with scale scores computed using the remaining six of the seven items constituting this scale (ranging from 6 x 1 = “6” to 6 x 9 = “54”).

Second, it is important that “if item deleted” statistics can be computed for each item. Good items hurt score reliability the most when they are not included. For example, for the nonslider data, the LibQUAL+ Reliability scale score alpha was .863, but if item #5 was omitted, it became .829. This suggests that item 5 was a very good item for the Reliability
Table 1. Varimax-Rotated Pattern/Structure Coefficients for Slider (n=420) and Nonslider (n=3987) Data.

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<tr>
<th>Item/Content Stem</th>
<th>Slider Factors (n=420)</th>
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<th>Nonslider Factors (n=3987)</th>
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<td>19 Willingness to help users</td>
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<td>.18</td>
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<td>18 Readiness to respond to user</td>
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<td>24 Deal with users in caring fashion</td>
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<td>20 Employees have knowledge</td>
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<td>34 Employees who are courteous</td>
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<td>9 Employees instill confidence</td>
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<td>11 Employees understand needs</td>
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<td>.20</td>
<td>.70</td>
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<td>41 Giving users individual attention</td>
<td>.62</td>
<td>.28</td>
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<td>15 Instruction in use, when needed</td>
<td>.49</td>
<td>.22</td>
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<td>.18</td>
<td>.61</td>
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<td>28 Performing services right</td>
<td>.61</td>
<td>.17</td>
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<td>.33</td>
<td>.58</td>
<td>.19</td>
<td>.32</td>
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<td>13 Users' best interests at heart</td>
<td>.46</td>
<td>.20</td>
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<td>38 Employees have neat appearance</td>
<td>.47</td>
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<td>.19</td>
<td>.48</td>
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<td>16 Maintain error free records</td>
<td>.45</td>
<td>.12</td>
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<td>.38</td>
<td>.40</td>
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<td>39 A meditative place</td>
<td>.13</td>
<td>.82</td>
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<tr>
<td>30 A haven for quiet and solitude</td>
<td>.17</td>
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<td>.82</td>
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<td>40 Space that facilitates quiet</td>
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<td>.14</td>
<td>.18</td>
<td>.80</td>
<td>.20</td>
<td>.05</td>
</tr>
<tr>
<td>12 A contemplative environment</td>
<td>.19</td>
<td>.81</td>
<td>.22</td>
<td>.10</td>
<td>.20</td>
<td>.79</td>
<td>.15</td>
<td>.19</td>
</tr>
<tr>
<td>4 A place for reflection</td>
<td>.10</td>
<td>.68</td>
<td>.34</td>
<td>.03</td>
<td>.12</td>
<td>.71</td>
<td>.08</td>
<td>.30</td>
</tr>
<tr>
<td>14 Comfortable and inviting location</td>
<td>.24</td>
<td>.72</td>
<td>.24</td>
<td>.15</td>
<td>.25</td>
<td>.69</td>
<td>.17</td>
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<td>29 Space group/individual study</td>
<td>.15</td>
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<td>.11</td>
<td>.33</td>
<td>.15</td>
<td>.66</td>
<td>.28</td>
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</tr>
<tr>
<td>22 Center intellectual interaction</td>
<td>.09</td>
<td>.72</td>
<td>.12</td>
<td>.22</td>
<td>.19</td>
<td>.63</td>
<td>.31</td>
<td>.05</td>
</tr>
<tr>
<td>21 A secure and safe place</td>
<td>.41</td>
<td>.45</td>
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<td>.12</td>
<td>.35</td>
<td>.36</td>
<td>.14</td>
<td>.26</td>
</tr>
</tbody>
</table>

(continued on page 592)
scale, because not using this item hurts the score integrity on this scale. The results of these various analyses are presented in Table 2.

**Scale Relationships**

Table 3 presents product-moment correlations of scores on the scales with each other and with total scores computed with all thirty-four LibQUAL+ items. Also presented in the table are correlations of subscale and total LibQUAL+ scores with scores on participants' rating of overall library quality.

This latter perception was collected at the end of the survey as a separate item. The correlations of LibQUAL+ scores with these global quality ratings are essentially concurrent validity coefficients.

**Mean LibQUAL+ Differences**

Also of interest were comparisons of LibQUAL+ means. These comparisons were made across both (a) LibQUAL+ scales, and (b) various demographic variables.

**Comparisons Across Scales.** The LibQUAL+ scales involve different numbers of items. To allow direct comparisons of scale means, for the purposes of
Table 2. Reliability Item Analysis Statistics for Slider (n=420) and Nonslider (n=3987) Data.

<table>
<thead>
<tr>
<th>Scale/Item</th>
<th>Slider Data</th>
<th>Nonslider Data</th>
<th>&quot;Corrected&quot; Total Scale Discrimination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&quot;Corrected&quot; Item-Total Correlation</td>
<td>α if Item Deleted</td>
<td>&quot;Corrected&quot; Item-Total Correlation</td>
</tr>
<tr>
<td>Service</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>.78</td>
<td>.918</td>
<td>.79</td>
</tr>
<tr>
<td>13</td>
<td>.69</td>
<td>.922</td>
<td>.72</td>
</tr>
<tr>
<td>24</td>
<td>.75</td>
<td>.919</td>
<td>.81</td>
</tr>
<tr>
<td>20</td>
<td>.74</td>
<td>.920</td>
<td>.79</td>
</tr>
<tr>
<td>18</td>
<td>.80</td>
<td>.917</td>
<td>.80</td>
</tr>
<tr>
<td>19</td>
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<td>.82</td>
</tr>
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<td>41</td>
<td>.68</td>
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<td>.76</td>
</tr>
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<td>9</td>
<td>.72</td>
<td>.920</td>
<td>.75</td>
</tr>
<tr>
<td>15</td>
<td>.61</td>
<td>.925</td>
<td>.67</td>
</tr>
<tr>
<td>38</td>
<td>.48</td>
<td>.931</td>
<td>.53</td>
</tr>
<tr>
<td>Scale α</td>
<td></td>
<td>.928</td>
<td></td>
</tr>
<tr>
<td>Library as Place</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>.75</td>
<td>.907</td>
<td>.72</td>
</tr>
<tr>
<td>12</td>
<td>.82</td>
<td>.903</td>
<td>.79</td>
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<td>.80</td>
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<td>.77</td>
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<td>.79</td>
<td>.904</td>
<td>.78</td>
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<td>29</td>
<td>.66</td>
<td>.914</td>
<td>.67</td>
</tr>
<tr>
<td>39</td>
<td>.76</td>
<td>.907</td>
<td>.77</td>
</tr>
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</tr>
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<td>.65</td>
<td>.914</td>
<td>.68</td>
</tr>
<tr>
<td>21</td>
<td>.48</td>
<td>.923</td>
<td>.45</td>
</tr>
<tr>
<td>Scale α</td>
<td></td>
<td>.919</td>
<td></td>
</tr>
<tr>
<td>Access to Collections</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>.59</td>
<td>.759</td>
<td>.64</td>
</tr>
<tr>
<td>35</td>
<td>.52</td>
<td>.774</td>
<td>.57</td>
</tr>
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<td>36</td>
<td>.60</td>
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<td>.60</td>
</tr>
<tr>
<td>32</td>
<td>.50</td>
<td>.777</td>
<td>.52</td>
</tr>
<tr>
<td>37</td>
<td>.60</td>
<td>.757</td>
<td>.64</td>
</tr>
<tr>
<td>10</td>
<td>.50</td>
<td>.777</td>
<td>.56</td>
</tr>
<tr>
<td>25</td>
<td>.43</td>
<td>.793</td>
<td>.49</td>
</tr>
<tr>
<td>Scale α</td>
<td></td>
<td>.797</td>
<td></td>
</tr>
<tr>
<td>Reliability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>.59</td>
<td>.820</td>
<td>.67</td>
</tr>
<tr>
<td>5</td>
<td>.58</td>
<td>.822</td>
<td>.74</td>
</tr>
<tr>
<td>2</td>
<td>.72</td>
<td>.800</td>
<td>.73</td>
</tr>
<tr>
<td>16</td>
<td>.55</td>
<td>.824</td>
<td>.57</td>
</tr>
<tr>
<td>1</td>
<td>.54</td>
<td>.828</td>
<td>.58</td>
</tr>
<tr>
<td>3</td>
<td>.62</td>
<td>.814</td>
<td>.60</td>
</tr>
<tr>
<td>17</td>
<td>.60</td>
<td>.817</td>
<td>.56</td>
</tr>
<tr>
<td>Scale α</td>
<td></td>
<td>.840</td>
<td></td>
</tr>
<tr>
<td>Total α</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Subscale and total score alpha coefficients are underlined. Total score results are computed as regards a single score produced using all 34 items.
Table 3. Product-moment Correlation Coefficients for Nonslider Data.

<table>
<thead>
<tr>
<th>LibQUAL+ Scale</th>
<th>Overall Rating</th>
<th>LibQUAL+ Subscale</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Service</td>
<td>Library as Place</td>
</tr>
<tr>
<td>Service</td>
<td>.678</td>
<td>.567</td>
</tr>
<tr>
<td></td>
<td>(3,769)</td>
<td>(3,987)</td>
</tr>
<tr>
<td>Library as Place</td>
<td>.532</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>(3,769)</td>
<td>(3,987)</td>
</tr>
<tr>
<td>Access to Collections</td>
<td>.675</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>(3,769)</td>
<td>(3,987)</td>
</tr>
<tr>
<td>Reliability</td>
<td>.659</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>(3,769)</td>
<td>(3,987)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>.733</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>(3,769)</td>
<td>(3,987)</td>
</tr>
</tbody>
</table>

Note. Sample sizes are reported in parentheses. All correlation coefficients are statistically significant at $\alpha = .001$.

these comparisons, subscale scores were divided by the number of scale items (e.g., 7 for the Reliability subscale) so that all means would fall within the same “1” (low) to “9” (high) score interval.

Figure 1 presents box-and-whisker plots for the four LibQUAL+ subscales for the 3,987 nonslider participants. Box-and-whisker plots present the score median as a bolder horizontal line within a box. The upper boundary of the box represents the third quartile (i.e., 75th percentile) while the lower boundary of the box represents the first quartile (i.e., 25 percentile). The location of the “whiskers” indicates the extreme score boundaries.

![Box-and-Whisker Plots for LibQUAL+ Subscales Each Scaled “1” to “9.”](image-url)
Comparisons Across Demographic Variables. To facilitate comparisons across demographic variables, the LibQUAL+ scores were converted to so-called T-scores (i.e., scores with means of 50 and standard deviations of 10). Some of these comparisons were expected to be trivial. For example, there seems to be no theoretical basis on which to expect female and male users to perceive libraries differently. On the LibQUAL+ nonslider scores, the mean total scores across gender were trivially different (i.e., $M_f = 49.9; SD_f = 9.8$, versus $M_m = 50.1; SD_m = 10.2$, $p = .461$). Table 4 presents comparisons of LibQUAL+ subscale and total score means across frequencies of library use, across participant role groups, and across participant disciplines.

LibQUAL+ Norms

Norms are used quite frequently in education and psychology. Norms tables allow the conversion of observed scores for a person into derived scores. These tables are developed by administering a given measure to a large representative sample of a target group. For example, an educational achievement test might be administered to a normative sample of 1,000 high school seniors whose demographic profile (e.g., gender, ethnicity, geographic location) closely matches that in the most recent U.S. Census.

Once a generic norm table is in hand, observed scores can be converted into normative scores or standard scores. For example, if high school senior Patrick got 87 items correct out of 93, the norms table could be consulted to determine that a score of 87 in the normative sample equaled a T-score (i.e., scores with means of 50 and standard deviations of 10) of 73. Or the norms table might indicate that Patrick's score of 87 correct answers was higher than 93 percent of the 1,000 high school seniors in the normative sample (i.e., Patrick's percentile rank was 93).

Furthermore, specialized norms can also be developed. Separate educational norms are frequently provided for both urban and nonurban school districts. For example, if Patrick resided in a rural school district, the rural norms might be relevant for some interpretations. These rural norms might indicate that his 87 correct answers corresponded to a T-score in this normative group of 71 while his percentile rank was 90.

Table 5 presents illustrative generic norms for LibQUAL+ total scores. Similar norms could easily be derived for LibQUAL+ subscale scores. The table indicates, for example, that a LibQUAL+ total score (computed by adding together the 34 items and then dividing the sum by 34) of 6.05 equaled a T-score of 45.14 in the sample of 3,987 in the sample of 3,987 participants, which was higher than 27 percent of the 3,987 total scores.

Consider, for example, that the Table 5 norms were deemed representative of users at all ARL libraries. If, in a future sample, an ARL library received a LibQUAL+ total score of 6.65, then librarians at that institution
Table 4. LibQUAL+ Subscale and Total Score Comparisons Across Library Use, Role Groups, and Disciplines for the Nonslider Data.

<table>
<thead>
<tr>
<th>Variable/Category</th>
<th>Service</th>
<th>Library as Place</th>
<th>Access to Collections</th>
<th>Reliability</th>
<th>LibQUAL+ TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>660</td>
<td>50.37 (10.03)</td>
<td>9.55 (10.20)</td>
<td>51.46 (9.65)</td>
<td>49.77 (10.41)</td>
</tr>
<tr>
<td>Weekly</td>
<td>1574</td>
<td>50.10 (10.08)</td>
<td>49.95 (10.25)</td>
<td>49.77 (10.37)</td>
<td>50.40 (9.98)</td>
</tr>
<tr>
<td>Monthly</td>
<td>1008</td>
<td>50.25 (9.54)</td>
<td>50.53 (9.70)</td>
<td>50.06 (9.65)</td>
<td>50.21 (9.39)</td>
</tr>
<tr>
<td>Quarterly</td>
<td>455</td>
<td>49.41 (10.75)</td>
<td>50.38 (9.91)</td>
<td>49.18 (10.32)</td>
<td>49.29 (10.54)</td>
</tr>
<tr>
<td>Never</td>
<td>51</td>
<td>46.58 (10.21)</td>
<td>48.15 (9.97)</td>
<td>45.96 (10.62)</td>
<td>45.33 (9.83)</td>
</tr>
<tr>
<td>( p )</td>
<td>0.060</td>
<td>0.172</td>
<td>&lt;.0001</td>
<td>0.002</td>
<td>0.044</td>
</tr>
<tr>
<td>( \eta^2 )</td>
<td>0.2%</td>
<td>0.2%</td>
<td>0.7%</td>
<td>0.4%</td>
<td>0.3%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Role</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Other</td>
<td>126</td>
<td>52.64 (9.25)</td>
<td>51.01 (9.95)</td>
<td>52.46 (9.09)</td>
<td>51.73 (9.54)</td>
<td>52.26 (9.81)</td>
</tr>
<tr>
<td>Undergraduate</td>
<td>998</td>
<td>48.64 (10.49)</td>
<td>53.09 (9.23)</td>
<td>51.08 (8.93)</td>
<td>49.01 (9.66)</td>
<td>50.59 (9.90)</td>
</tr>
<tr>
<td>Research Scientist</td>
<td>23</td>
<td>49.90 (8.58)</td>
<td>51.75 (9.29)</td>
<td>50.15 (9.34)</td>
<td>48.92 (10.01)</td>
<td>50.37 (9.35)</td>
</tr>
<tr>
<td>Graduate</td>
<td>1281</td>
<td>50.25 (9.88)</td>
<td>49.88 (9.87)</td>
<td>49.91 (10.28)</td>
<td>50.78 (10.03)</td>
<td>50.21 (10.01)</td>
</tr>
<tr>
<td>Librarian</td>
<td>537</td>
<td>50.50 (8.48)</td>
<td>48.53 (9.76)</td>
<td>51.47 (8.64)</td>
<td>48.71 (9.05)</td>
<td>49.70 (8.38)</td>
</tr>
<tr>
<td>Faculty</td>
<td>1022</td>
<td>50.43 (10.38)</td>
<td>47.73 (10.26)</td>
<td>47.98 (11.03)</td>
<td>50.48 (10.65)</td>
<td>49.04 (10.55)</td>
</tr>
<tr>
<td></td>
<td>$p$</td>
<td>&lt;.0001</td>
<td>&lt;.0001</td>
<td>&lt;.0001</td>
<td>&lt;.0001</td>
<td>.001</td>
</tr>
<tr>
<td>-------</td>
<td>-----------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td>------</td>
</tr>
<tr>
<td><strong>eta^2</strong></td>
<td>0.8%</td>
<td>4.1%</td>
<td>1.8%</td>
<td>0.8%</td>
<td>0.5%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Discipline</th>
<th>322</th>
<th>51.30 (9.97)</th>
<th>53.14 (9.66)</th>
<th>51.68 (9.62)</th>
<th>51.01 (10.34)</th>
<th>52.18 (10.12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business</td>
<td>61</td>
<td>52.35 (9.36)</td>
<td>51.89 (10.26)</td>
<td>50.94 (10.03)</td>
<td>51.86 (9.66)</td>
<td>52.16 (9.80)</td>
</tr>
<tr>
<td>Architecture</td>
<td>260</td>
<td>51.27 (11.14)</td>
<td>51.90 (10.35)</td>
<td>51.06 (10.22)</td>
<td>51.01 (11.01)</td>
<td>51.60 (11.04)</td>
</tr>
<tr>
<td>Education</td>
<td>374</td>
<td>50.93 (9.09)</td>
<td>49.59 (9.28)</td>
<td>50.35 (9.51)</td>
<td>51.18 (9.04)</td>
<td>50.55 (8.94)</td>
</tr>
<tr>
<td>Health</td>
<td>434</td>
<td>49.77 (9.49)</td>
<td>51.58 (9.46)</td>
<td>49.79 (9.30)</td>
<td>50.49 (9.58)</td>
<td>50.53 (9.51)</td>
</tr>
<tr>
<td>Science</td>
<td>153</td>
<td>49.12 (10.82)</td>
<td>51.64 (9.53)</td>
<td>50.44 (9.69)</td>
<td>49.62 (9.57)</td>
<td>50.25 (10.10)</td>
</tr>
<tr>
<td>Fine Arts</td>
<td>41</td>
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<td>49.35 (8.94)</td>
<td>49.92 (7.90)</td>
<td>49.88 (8.31)</td>
<td>50.16 (7.56)</td>
</tr>
<tr>
<td>Vet Medicine</td>
<td>682</td>
<td>49.73 (10.00)</td>
<td>50.71 (9.40)</td>
<td>49.32 (10.59)</td>
<td>50.09 (10.17)</td>
<td>50.02 (9.99)</td>
</tr>
<tr>
<td>Libraries</td>
<td>479</td>
<td>50.72 (8.36)</td>
<td>48.63 (9.86)</td>
<td>51.55 (8.76)</td>
<td>48.99 (8.90)</td>
<td>49.90 (8.92)</td>
</tr>
<tr>
<td>Law</td>
<td>69</td>
<td>49.20 (9.95)</td>
<td>49.84 (9.94)</td>
<td>49.90 (9.24)</td>
<td>49.53 (8.41)</td>
<td>49.52 (9.04)</td>
</tr>
<tr>
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<td>48.80 (10.01)</td>
<td>48.99 (10.46)</td>
<td>49.49 (9.91)</td>
<td>48.89 (10.09)</td>
</tr>
<tr>
<td>Humanities</td>
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<td>46.89 (11.03)</td>
<td>48.72 (10.80)</td>
<td>48.89 (11.51)</td>
<td>47.94 (11.30)</td>
</tr>
</tbody>
</table>

Note. "Eta^2" is a variance-accounted-for effect size. It indicates what percentage of the variance in the LibQUAL+ scores could be explained by knowledge of the user groups to which different participants belonged.
Table 5. Illustrative Table of Norms for LibQUAL+ Total Scores Based on Nonslider Data \((n = 3987)\).

<table>
<thead>
<tr>
<th>Raw Score</th>
<th>%tile</th>
<th>T Score</th>
<th>Raw Score</th>
<th>%tile</th>
<th>T Score</th>
<th>Raw Score</th>
<th>%tile</th>
<th>T Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.38</td>
<td>1</td>
<td>20.12</td>
<td>3.94</td>
<td>2</td>
<td>25.38</td>
<td>4.26</td>
<td>3</td>
<td>28.39</td>
</tr>
<tr>
<td>4.50</td>
<td>4</td>
<td>30.60</td>
<td>4.65</td>
<td>5</td>
<td>31.98</td>
<td>4.75</td>
<td>6</td>
<td>32.97</td>
</tr>
<tr>
<td>4.90</td>
<td>7</td>
<td>34.34</td>
<td>5.00</td>
<td>6</td>
<td>35.28</td>
<td>5.10</td>
<td>9</td>
<td>36.24</td>
</tr>
<tr>
<td>5.18</td>
<td>10</td>
<td>36.99</td>
<td>5.26</td>
<td>11</td>
<td>37.71</td>
<td>5.33</td>
<td>12</td>
<td>38.56</td>
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<td>13</td>
<td>39.00</td>
<td>5.47</td>
<td>14</td>
<td>39.68</td>
<td>5.53</td>
<td>15</td>
<td>40.23</td>
</tr>
<tr>
<td>5.62</td>
<td>16</td>
<td>41.06</td>
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could re-express the rating as a normative score of \(T = 50.68\). Furthermore, the staff could then say, "if perceptions of use were compared to those of all ARL libraries, we would score higher than approximately 48 percent of all the ratings provided in the normative sample."

To make the use of norms even more concrete, Figure 2 presents \(T\)-scores for three respondent groups for one of the schools (pseudonym "Higher University") in the LibQUAL+ phase one study. For the present heuristic purposes, imagine that the Table 5 norms and the related generic norms for the four subscales were created from an independent normative sample measured at some prior time and not created using data involving the current respondents from Higher University.
The normative comparisons presented in Figure 2 suggest a number of conclusions. First, relative to the normative sample, the current respondents at Higher University rated the HU Library at or below the 50th percentile (or median) on all LibQUAL+ dimensions, including the total score. Second, respondents were most homogeneous in their ratings as regards the Service and Reliability subscales. Third, faculty were uniformly most critical of the HU Library. For example, the mean rating by faculty of Access to Collections ($M = 43.9$, as indicated by the location of the triangle in Figure 2) was only higher than roughly 20 percent of the ratings in the prior normative sample on this LibQUAL+ dimension.

**DISCUSSION**

The present study was conducted to address five research questions:

1. Can a meaningful and replicable structure underlying user perceptions of library services be identified?
2. Can psychometrically-stable scores on LibQUAL+ dimensions be generated?
3. Are scores on different LibQUAL+ dimensions of user perceptions correlated with each other and with user overall ratings of library service quality?
4. Do comparisons of LibQUAL+ subscale and total scores across user types suggest that LibQUAL+ scores are psychometrically valid?
5. Can standardized norms potentially be developed to assist librarians in understanding user perceptions of library service quality and targeting areas of needed or desired improvement?
The answers to all five questions appear to be "yes." However, these answers warrant some further elaboration.

**LIBQUAL+ Dimensions**

It is striking that the factor structure reported in Table 1 was generally replicated so well across the two independent subsamples. The factors appear to be meaningful. The items are generally "univocal" (i.e., "speak" primarily through a single factor). And the results are consistent with related analyses using different methods and the wider set of all forty-one items (cf. Cook, Heath, & Thompson, 2000b).

**Score Reliability**

As reported in Table 2, the LibQUAL+ subscale and total scores had impressive reliability coefficients. Especially noteworthy were the reliabilities for the LibQUAL+ total scores which were .952 and .958 for the slider and nonslider data, respectively.

Of course, it is important to bear in mind that tests are not reliable (Thompson & Vacha-Haase, 2000). As the APA Task Force on Statistical Inference recently emphasized:

> It is important to remember that a test is not reliable or unreliable. Reliability is a property of the scores on a test for a particular population of examinees . . . . Thus, authors should provide reliability coefficients of the scores for the data being analyzed even when the focus of their research is not psychometric. (Wilkinson & APA Task Force on Statistical Inference, 1999, p. 596)

The important implication is that each time LibQUAL+ is administered, it will be necessary to conduct analyses to assure that each given data set is psychometrically sound. This will be particularly important as items are added and deleted during continuing refinement of the protocol.

**Score Correlations**

It is certainly important that LibQUAL+ scores correlated highly with independent global ratings of library quality as reported in Table 3. And it is important that LibQUAL+ subscale scores were all highly correlated with total scores.

However, the large correlations among the LibQUAL+ subscale scores, ranging from .546 to .773, suggest that a single dimension may be used to characterize user perceptions. The "corrected" item discrimination (item-score-to-total-score correlations) presented for LibQUAL+ total scores in the last two columns of Table 2 are also consistent with this view. For the slider data, these corrected item discrimination coefficients ranged from .45 to .72, and for the nonslider data ranged from .50 to .73. The service items tended to be most highly correlated with the total scores, suggesting that perceptions of service saturate the ratings.
Tables 1, 2, and 3 suggest that users *simultaneously* think about library quality both using first-order subscale dimensions and at a second-order aggregate level. This interpretation is supported by “higher-order” factor analyses we have reported elsewhere for both these and other data (Cook, Heath, & Thompson, 2000b; Cook & Thompson, in press).

Figure 3 graphically presents a hierarchical LibQUAL+ factor model. The model posits that selected items measure one of the four first-order factors (e.g., Affect of Service, Library as Place). However, the first-order factors are themselves correlated and aggregate at the second-order level into a single overarching Service Quality perceptions factor. We believe users think simultaneously at both levels. If our view is correct, for most applications, both LibQUAL+ subscale and total scores will be necessary to summarize user perceptions.

![Figure 3. A Hierarchical LibQUAL+ Factor Model.](image)

**Mean Comparisons**

It is heartening that, as expected, LibQUAL+ scores did not differ across gender. It is also heartening that user perceptions did not differ much across user frequency of library use, as reported in Table 4. Only users who reported using the library “never” differed appreciably in their ratings of the libraries.

Users also tended to be fairly homogeneous in their views across role groups. There was the most variation ($\eta^2 = 4.1\%$) on the Library as Place subscale. The undergraduate students tended to be most favorable ($T$-score mean = 53.1) and the faculty the least favorable ($T$-score mean = 47.7) as regards this dimension.

Regarding user disciplines, observed differences were relatively small. The largest differences ($\eta^2 = 3.1\%$) occurred on the Library as Place subscale. Business respondents were most positive ($T$-score mean = 53.1)
and Humanities respondents were most negative \((T\text{-}score \text{ mean} = 46.9)\) on this dimension.

Regarding comparisons across subscales, the 3,879 respondents rated all four dimensions fairly highly, as reported in Figure 1. However, respondents were somewhat more homogeneous and rated somewhat more highly perceived Service and perceived Reliability. It is noteworthy that Service and Reliability items tended to be most highly correlated with LibQUAL+ total scores, as reported in Table 2.

**LibQUAL+ Norms**

Table 5 and Figure 2 illustrate the development and use of norms for LibQUAL+. Although only *generic* norms for total scores were presented in Table 5, *generic* norms were also computed for the four LibQUAL+ subscales. Furthermore, *specialized* norms have been developed and may also be useful. For example, norms can be developed by (a) user group (e.g., faculty, graduate students), (b) discipline, or (c) campus type or setting (e.g., urban, private).

The potential to develop norms for specialized comparisons across ARL members hints at the potential of the LibQUAL+ protocol. If both generic and specialized norms were eventually developed for a large sample of users at ARL institutions, LibQUAL+ could then be used to make a series of intelligent comparisons with various reference groups. Such comparisons could then facilitate the ultimate application of LibQUAL+: identifying areas of potential improvement at a given library and identifying similar libraries with more favorable profiles whose behavior might then be modeled in pursuit of providing better service to library users.

**REFERENCES**


Assessing User Needs, Satisfaction, and Library Performance at the University of Washington Libraries

Steve Hiller

ABSTRACT
The University of Washington Libraries has conducted triennial faculty and student library surveys since 1992. Surveys are sent to all faculty and a random sample of graduate and undergraduate students. Results have revealed significant variation within and between user groups concerning library satisfaction, use, priorities, and importance. There were 2,749 responses to the most recent survey in 1998, including more than 1,500 completed surveys returned from faculty. These large-scale surveys, while extraordinarily valuable, have proven costly and time-consuming to design, administer, and analyze. The ARL LibQUAL+ pilot offered an opportunity to employ a different methodology and design that focused on quality of service and library support through a Web-based survey. This article discusses issues and results associated with these different approaches.

INTRODUCTION
The University of Washington Libraries (UW Libraries) has utilized a number of approaches during the past decade to assess the effectiveness of service programs and library support of faculty and student research, teaching, and learning. Among the most valuable methods employed have been large-scale surveys of faculty and students conducted every three years beginning in 1992. Focus groups, usability and observational studies, targeted surveys, and interviews are also used to assess library programs and services as well as user needs. Results from the triennial surveys

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have played a critical role in supporting the transition to a user-centered library (Wilson, 1995) and in creating a culture of assessment (Lakos, 1998). The large representative data sets generated by these surveys have also proven to be powerful information sources in the campus political environment. Survey results and analyses can be found at the UW Libraries’ Web site on user surveys: http://www.lib.washington.edu/surveys/.

These surveys, though quite valuable, are expensive and time-consuming to design, administer, and analyze. Participation in the ARL-sponsored SERVQUAL (now LibQUAL+) pilot provided an opportunity to use a well-established survey tool with a different methodology, design, content, and delivery mechanism. It also afforded the chance for interinstitutional comparisons using a standardized survey instrument. Another attractive feature was the ability to gain experience with a Web-based survey that might reduce survey costs associated with printing, mailing, and data entry.

This article will compare the UW Libraries’ surveys with LibQUAL+ results from the University of Washington in such areas as response and representativeness of survey population, similarities and differences in results, and whether the right questions are being asked.

User Surveys

Library user surveys have become widespread in academic libraries during the past twenty years. Surveys have often been used as a tool to assess service quality and user satisfaction. The Association of Research Libraries issued four Systems and Procedures Exchange Center (SPEC) kits on user surveys and studies between 1981 and 1994 (Association of Research Libraries, 1981, 1984, 1988, 1994). A substantial body of literature has been developed on surveys and service quality, led by studies and reviews from such library educators/professionals as Hernon and McClure (1990); Van House, Weil and McClure (1990); Hernon and Altman (1998, 2000); Nitecki and Franklin (1999); and Hernon and Whitman (2001). Library applications of the SERVQUAL instrument have been covered by Nitecki (1996), and Cook and Heath (1999), among others. Rapid changes in library services and operations, demands for internal institutional accountability, and assessment expectations by external accrediting agencies have contributed to further development and application of user surveys within academic libraries during the past decade.

User surveys can be designed and administered in a number of ways. Self-administered surveys are often employed to reach a large number of potential respondents with a minimum of direct contact and cost. Individuals are given or sent surveys to complete and return and the responses turned into data that can be analyzed. Surveys can range from broad and comprehensive to those narrowly focused on specific services or activities. When properly designed and administered, user surveys can provide both quantitative and qualitative data directly from the target population.
University of Washington Libraries' Survey Methodology and Design

The University of Washington Libraries began an active program of assessing user needs, satisfaction, and the impact of library services and resources in 1992. Prior to this time, user input to the UW Libraries was generally informal and unsolicited through such channels as suggestion boxes and anecdotal comments from service desks. Other opportunities for user comment came through the Faculty Senate Council on University Libraries, a biennial meeting between subject selectors and faculty liaisons on collections-related issues and some earlier in-library surveys that focused on specific activities within the library unit. The catalyst for the development of a broad-based survey of faculty and students came from the UW Libraries’ first strategic plan in 1991 that called for a user-centered approach to services. Specifically, the strategic plan recommended that the libraries: “Develop and implement a study to identify user populations, their information needs and how well they are being met” (University of Washington Libraries, 1991, p. 15).

The Task Force on Library Services was appointed by the Director of Libraries in late 1991 to design and implement a user survey that would provide information on the following:

- determine who users and potential users are;
- how and why the library is used (or isn’t used);
- what sources are used for library-related information;
- what faculty and students’ library-related needs are; and
- how satisfied faculty and students are with the libraries.

The literature on academic library user surveys available at the time of the early 1990s revealed a wide spectrum of applications and uses (see Association of Research Libraries, 1984, 1981, 1991; Van House, Weil, & McClure, 1990). Some common characteristics of these surveys were:

- distribution within the library to users was more prevalent than mailed surveys;
- focus on physical use of the library (e.g., “what did you do in the library today?”);
- concentration on specific services (especially the online catalog); and
- interest in user satisfaction.

The task force designed the initial survey in 1992 in consultation with library staff and the University’s Office of Educational Assessment (OEA). The decision was made early in the design process to survey all user groups, distribute the survey through the mail in order to reach potential nonusers, and provide similar survey content for each group to enable comparisons. The survey would be sent to all faculty and a random sample of graduate and undergraduate students. While distributing the survey to
all faculty would increase costs, it would also facilitate survey promotion and publicity, obtain sufficient number of responses to do analysis by academic subject areas, and foster positive political outcomes.

Survey questions were similar for faculty and graduate students, with about 75 percent consistency between faculty and undergraduates. Adequate space was provided for survey respondents to write comments. Content evolved with each subsequent survey in 1995 and 1998, and some aspects of survey design changed. Rapid changes in library services and programs during the 1990s and usefulness of the data provided by some questions were prime factors in survey revision. However, there was a core group of questions in each survey that dealt with:

- information sources needed for research, teaching, and learning;
- reasons and frequency of library use;
- campus computer network connectivity;
- use of electronic resources;
- instructional needs and effectiveness;
- library unit use;
- satisfaction; and
- services availability or satisfaction.

The initial survey in 1992 was pilot tested in March with a group of faculty and students, revised, and then mailed mid-way through the Spring quarter to 3,900 faculty and a random, nonstratified, sample of 1,000 graduate and 1,000 undergraduate students (sample size was based on an expected 50 percent return rate). An incentive (entry into a drawing for bookstore gift certificates) was offered to students who returned completed survey forms. Two weeks after the initial surveys were mailed, students were sent a second survey form, while faculty were sent a reminder notice. Completed surveys were returned to the Office of Educational Assessment (OEA) who arranged for data entry. Data were made available in SPSS format and results were available in early September 1992.

Subsequent surveys in 1995 and 1998 generally employed a similar methodology and design. Survey design work began in January of each year, pilot testing took place in March, and surveys were mailed in late April to early May. The undergraduate sample was increased to 2,000 for 1995 and 1998, and the 1998 survey also included a specialized set of questions for faculty and graduate students in the biological and health sciences, and one for faculty and students in the fine arts. Focus groups were also held prior to the 1998 survey to provide input from users on their perception of issues and concerns. The bookstore gift certificate drawing was extended to all groups beginning with the 1995 survey. Reminder notices were sent in 1995 but not a follow-up survey form. In 1998, a survey accompanied the reminder letter. Both the cover letter and survey form included the name, phone number, and e-mail address of a librarian.
as a contact person for questions or clarification. The few questions received generally requested another survey be sent to replace a lost one.

Sending this type of survey to nearly 7,000 faculty and students is not inexpensive. Direct survey costs (not including library staff time) in 1998 totaled $19,000, about $7 per returned survey. Survey costs in 1992 and 1995 were about $12,000. The 1998 costs were distributed in the following manner: printing 30 percent; mailing 30 percent; data entry 30 percent; other 10 percent (consultation, incentives). Staff time for the 1998 survey was estimated at approximately 500 hours, including analysis and reporting.

LibQUAL+

The UW Libraries was one of twelve libraries that participated in the ARL-sponsored LibQUAL+ pilot administered in Spring 2000 (Cook, Heath, & Thompson, 2000a, 2000b). Survey design and methodology were handled primarily by a team from Texas A&M where a SERVQUAL-based library survey had been used several times (Cook & Heath, 1999). In addition to the twenty-two basic SERVQUAL questions which covered the standard dimensions of accountability, assurance, reliability, responsiveness, and tangibles, nineteen additional questions were added to test two additional dimensions: access to collections and the library as place. Thus, there were forty-one questions that used the SERVQUAL three-column response format of minimum, perceived, and desired. Another fourteen behavioral questions, two on frequency of library use, and an overall service quality question were also added which used just one response column. The survey also collected demographic data.

The survey team at Texas A&M determined that the survey be administered to a random sample of 600 faculty, 600 graduate students, and 900 undergraduates at each institution based on an anticipated return of 200 surveys from each group. The UW Office of Educational Assessment extracted the sample from the faculty and student databases, and e-mail address lists created for each group were sent to the UW Libraries. The UW Libraries systems office created separate mailing lists for each group. A cover letter from the director of the UW Libraries was sent by e-mail to each participant. The letter included information about the survey and the university’s reasons for participation, and also provided a URL address where respondents could complete the survey. The initial message was sent May 2 and a reminder notice was sent on May 11. Almost immediately after the initial e-mail notification was sent, there was a steady stream of messages back to the director and the local survey coordinator. LibQUAL+ implementation at the University of Washington ultimately generated more than fifty e-mail messages, most coming from faculty members. The messages fell into two basic groups: technical problems trying to complete the survey, and comments, usually negative, on survey design and content.
Direct expenses were $2,000 for the UW Libraries paid as a participant in the ARL project. This worked out to be about $5 per completed survey (excluding surveys from library staff). Library staff contributed about 150 hours to the project, including responding to e-mail messages, analysis, and report writing.

**Survey Response and Representatives**

Survey return rates for the 1992, 1995, and 1998 UW Libraries' surveys and the 2000 LibQUAL+ survey are shown in Table 1.

A second survey mailing appeared effective in raising the response rate as seen in the 1992 return rates for students and for all groups in 1998. The number of faculty surveyed varied according to criteria used to define the faculty pool, but all surveys included tenure track and research faculty as well as full-time lecturers. The overall response rate as shown is slightly understated as undeliverable surveys were not subtracted from the total sent out. Undeliverable survey rates ranged from approximately .5 percent of faculty to 2 percent of undergraduate students. Response rates to the LibQUAL+ survey were substantially lower. The definition of faculty was the same as used in the UW Libraries' 1998 survey. LibQUAL+ response rates were calculated by matching the number of completed surveys against the number of e-mail addresses to which the survey message was sent. Approximately 1 percent of these messages were undeliverable.

**Representativeness of Survey Respondents**

The large number of responses to the UW Libraries' surveys generated correspondingly large data sets, especially for the faculty survey. As Table 2 shows, the faculty survey respondent population in 1998 was reasonably representative of the population as a whole when grouped by broad subject areas. Faculty in the Health Sciences were slightly underrepresented, while those in the Humanities/Social Sciences/Fine Arts group were somewhat over-represented compared to the actual population. Response rates by academic schools ranged from 31 percent in Business to 54 percent in the Social Science departments within the College of Arts and Sciences.

Graduate student responses (Table 3) were similar to the faculty with Health Sciences respondents again lower than their percentage of the actual population while those from Humanities/Arts/Social Sciences were slightly higher. Response rates by academic schools ranged from 24 percent in Dentistry and 28 percent in Education to 62 percent in Nursing and 72 percent in Social Sciences. Health Sciences does have a larger proportion of faculty and graduate/professional students located away from the main UW campus, and this may be a factor in the underrepresentation of respondents from those areas.
Table 1. Surveys Distributed and Returned

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<td>3900</td>
<td>1108</td>
<td>28.4%</td>
<td>1000</td>
<td>561</td>
<td>56.1%</td>
</tr>
</tbody>
</table>

(2000 is LibQUAL+ Web-based survey; 1992, 1995, 1998 are UW Libraries mail surveys)

Table 2. Faculty Population and Respondents by Academic Area, 1998 and 2000

<table>
<thead>
<tr>
<th>Academic Area</th>
<th>2000 LibQUAL+ respondents n=128</th>
<th>1998 Faculty population n=3750</th>
<th>1998 Survey respondents n=1503</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Sciences</td>
<td>43.0%</td>
<td>48.6%</td>
<td>44.7%</td>
</tr>
<tr>
<td>Sciences/Engineering</td>
<td>25.8%</td>
<td>26.2%</td>
<td>27.1%</td>
</tr>
<tr>
<td>Humanities/Arts/Social Sciences</td>
<td>31.2%</td>
<td>21.0%</td>
<td>24.4%</td>
</tr>
<tr>
<td>Other (non-Health Sciences)</td>
<td>4.2%</td>
<td>3.8%</td>
<td></td>
</tr>
</tbody>
</table>
Table 3. Graduate/Professional Student Population and Survey Respondents by Academic Area

<table>
<thead>
<tr>
<th>Academic Area</th>
<th>2000 LibQUAL+ n=131</th>
<th>1998 Graduate Population n=8188*</th>
<th>1998 Survey Respondents n=457</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Sciences</td>
<td>22.1%</td>
<td>30.4%</td>
<td>26.0%</td>
</tr>
<tr>
<td>Sciences/Engineering</td>
<td>28.20%</td>
<td>29.4%</td>
<td>30.2%</td>
</tr>
<tr>
<td>Humanities/Arts/Social Sciences</td>
<td>45.0%</td>
<td>40.3%</td>
<td>43.8%</td>
</tr>
<tr>
<td>Other (non-Health Sciences)</td>
<td>4.6%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Law was not included in the 1998 survey. 1998 graduate population with Law is 8,785, Law is 6.9% of total.

Table 4. Undergraduate Student Population and Survey Respondents by Year

<table>
<thead>
<tr>
<th>Class</th>
<th>2000 LibQUAL+ n=137</th>
<th>1998 Undergrad population n=23413</th>
<th>1998 Undergrad respondents n=787</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>22.6%</td>
<td>19.0%</td>
<td>14.4%</td>
</tr>
<tr>
<td>Sophomore</td>
<td>13.9%</td>
<td>18.3%</td>
<td>17.0%</td>
</tr>
<tr>
<td>Junior</td>
<td>27.7%</td>
<td>26.3%</td>
<td>26.9%</td>
</tr>
<tr>
<td>Senior</td>
<td>35.8%</td>
<td>32.9%</td>
<td>33.9%</td>
</tr>
<tr>
<td>Other (including 5th year)</td>
<td>3.4%</td>
<td>7.8%</td>
<td></td>
</tr>
</tbody>
</table>
Determining how representative undergraduate respondents are is more complicated. Undergraduates in earlier UW Libraries’ surveys appeared to identify with certain academic majors (business, engineering) before they were actually accepted into those programs, thus skewing responses by academic areas. Year in school appeared to be a more reliable measure. Table 4 shows undergraduate population and respondent population by year in school. Again, the respondent population is reasonably similar to the entire population. Freshmen were somewhat underrepresented in the 1998 survey and sophomores underrepresented in the LibQUAL+ survey.

Compared to the population as a whole, and UW survey respondents in 1998, the LibQUAL+ respondent pools, although significantly smaller than those generated by UW surveys, appear reasonably representative when grouped by broad academic areas for faculty and graduate students, and by class for undergraduates (for a discussion on representativeness and response rates, see Thompson, 2000). The underrepresentation of Health Sciences and overrepresentation by those in the Social Sciences mirrors the respondent population achieved in the large-scale UW Libraries’ surveys. This is probably reflective of the way faculty and students in these areas use libraries as well as the larger proportion of the Health Sciences population located away from the main Seattle campus.

Survey Results

Results from the UW Libraries’ surveys provide an effective record of changes in the way that students and faculty used library and information resources during the 1990s. These results also documented significant variations within groups (i.e., between academic areas) and between groups (i.e., faculty and undergraduates) in some areas. Information from these surveys has been used extensively by the University of Washington Libraries to revise existing programs and services and promote new ones. Survey results showed:

- high satisfaction levels;
- a shift toward remote use and increased importance of electronic resources;
- continuing importance of libraries as place for students; and
- increased complexity of finding and using information for teaching, learning, and research.

Although the University of Washington Libraries’ surveys and the LibQUAL+ survey differs substantially in design and content, it is interesting to compare results where questions were similar. The large respondent pool for the 1998 UW Libraries survey can serve as a benchmark for
viewing the LibQUAL+ results based on a much smaller sample. For example, UW Libraries’ surveys results revealed that faculty generally viewed the libraries through a collections-related focus, while undergraduate students placed a high value on the library as a place. Even though the questions and design in these surveys differ, would LibQUAL+ results also show similar responses? Results from the UW Libraries’ survey in 1998 and the LibQUAL+ survey in 2000 will be compared in the areas of overall satisfaction, opening hours, collections importance, the library as a place, and remote use of library services and resources. These areas are often barometers of service quality.

Overall Satisfaction

Responses to overall library satisfaction questions on the 1998 survey showed faculty had the highest satisfaction while undergraduate students the lowest (see Table 5). The LibQUAL+ survey phrased the questions as overall quality of services but still produced similar results although the difference in Likert scales (1 to 5 in UW Libraries, 1 to 9 in LibQUAL+) can lead to a different type of response. For LibQUAL+, the differences between undergraduate scores and graduate and faculty ones were significant at the .10 level using t-tests.

Library Hours

The 1998 survey asked whether libraries were open when needed on evenings, weekends, summer, and interim periods. Graduate students, as the case with the previous two surveys, had the lowest satisfaction with hours while faculty had the highest, as shown in Figure 1. Undergraduate student satisfaction had slipped from 1995 when it was similar to faculty satisfaction. When asked to choose from a list of priorities, more than 37 percent of graduate students and 42 percent of undergraduates chose increased library hours as a priority compared to 17 percent of faculty. Graduate students also wrote more comments about hours than any other group.

The LibQUAL+ question was concerned about expectations and perceived level of service related to whether the library had convenient business hours (which is a somewhat different question from that used in the UW Libraries survey). As Table 6 shows, graduate student minimum expectations for convenient business hours exceeded their perception of library performance. Faculty minimum expectations were lower, and the gap between expectations and performance, while small, was positive. Undergraduate students had both the highest perceived value (7.13) and most positive gap (.63). One likely reason for this positive response in LibQUAL+ was the Undergraduate Library’s move to 24 hour opening in autumn 1998.

Collections

A valuable part of each one of the UW Libraries’ surveys is asking users to identify their library priorities from a list of ten to twelve choices.

<table>
<thead>
<tr>
<th>Level</th>
<th>LibQUAL+ Faculty</th>
<th>1998 Faculty</th>
<th>LibQUAL+ Grad students</th>
<th>1998 Grad students</th>
<th>LibQUAL+ Undergrads</th>
<th>1998 Undergrads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very satisfied</td>
<td>78.0%</td>
<td>91.3%</td>
<td>80.9%</td>
<td>84.9%</td>
<td>72.9%</td>
<td>78.5%</td>
</tr>
<tr>
<td>Satisfied</td>
<td>21.2%</td>
<td>7.8%</td>
<td>18.3%</td>
<td>13.5%</td>
<td>24.0%</td>
<td>19.9%</td>
</tr>
<tr>
<td>Not satisfied</td>
<td>0.8%</td>
<td>0.9%</td>
<td>0.8%</td>
<td>1.6%</td>
<td>3.1%</td>
<td>1.6%</td>
</tr>
<tr>
<td>Mean Score</td>
<td>7.17</td>
<td>4.33</td>
<td>7.13</td>
<td>4.11</td>
<td>6.88</td>
<td>3.99</td>
</tr>
</tbody>
</table>

Very satisfied on LibQUAL+ are percentage respondents choosing 7-9 on scale of 1-9; UW 1998 survey are those choosing 4-5 on scale of 1 to 5. Satisfied on LibQUAL+ are percentage respondents choosing 4-6 on scale of 1-9; UW 1998 survey satisfied are those marking 3 on a scale of 1 to 5. Not satisfied on LibQUAL+ are percentage respondents choosing 1-3 on scale of 1-9 and UW choosing 1-2.

Table 6. LibQUAL+ Convenient Business Hours.

<table>
<thead>
<tr>
<th></th>
<th>Faculty Minimum</th>
<th>Faculty Perceived</th>
<th>Grad Minimum</th>
<th>Grad Perceived</th>
<th>Undergrad Minimum</th>
<th>Undergrad Perceived</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. Convenient Business Hours</td>
<td>6.45</td>
<td>6.56 (.11)</td>
<td>6.68</td>
<td>6.63 (.05)</td>
<td>6.50</td>
<td>7.13 (.63)</td>
</tr>
</tbody>
</table>

Means of minimum service level and perceived level of service are shown along with mean gaps between the two in parentheses.
The list of potential priorities is compiled from comments provided on the pretests as well as areas the libraries are interested in. The first survey in 1992 showed that all three groups had the same priorities in their top three choices (build collections, network bibliographic databases, and improve the online catalog), while in 1998 the top three priorities for undergraduates were different than those for graduate students and faculty. Faculty, in particular, showed an almost exclusive focus on collections/information resources-related areas as shown in Table 7.

The LibQUAL+ survey reinforced the primacy of collections and information resources for faculty. This was the only area where faculty had negative gap scores (resources added to the collection on request, full-text delivered electronically to desktop, and complete runs of journal titles). Faculty minimum expectations were generally higher as well. Graduate student results also showed high expectations for collections-related questions and negative gaps for full-text delivered electronically and complete journal runs. Undergraduate students had lower expectations and positive gaps in all collections related areas.

Reviewing mean scores for six collections-related questions on LibQUAL+ showed higher mean scores for faculty and graduate students in minimum expectations (see Table 8). However, the differences between undergrads and faculty were not significant at the .05 or .10 level according to t-tests. There were differences at the .05 level between grad students and undergraduates in complete runs of journal titles and comprehensive print collections, and at the .10 level for timely document delivery and interlibrary loan.

Library As Place

A consistent theme revealed through each of the UW Libraries’ surveys has been the different perspectives of faculty and students on the library as a place. Faculty use of the library is primarily collections driven, while students view the library as a place to do work, including finding and using information resources. This difference shows up dramatically in responses to a 1998 survey question on reasons for visiting the library (Figure 1) as well as other questions dealing with priorities and needed services.

LibQUAL+ clearly showed similar differences between faculty and students on the library as a place (see Table 9). On seven questions related to the library as place, the differences in minimum expectations were significant at the 0.01 level except for “safe and secure space.” With the exception of “secure and safe space,” faculty minimum expectations were generally below 5 and gaps between minimum and perceived were larger than 1.0. While graduate student expectations were higher than those of faculty, they were still lower than those of undergraduates. Both student groups were concerned about quiet study areas.

<table>
<thead>
<tr>
<th>Priority</th>
<th>Faculty</th>
<th>Graduate Students</th>
<th>Undergraduates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintain quality of print collections</td>
<td>69.6%</td>
<td>52.3%</td>
<td>28.2%</td>
</tr>
<tr>
<td>Deliver full-text to your computer</td>
<td>60.4%</td>
<td>55.8%</td>
<td>34.4%</td>
</tr>
<tr>
<td>Deliver bib databases through the Web</td>
<td>52.1%</td>
<td>40.0%</td>
<td>17.7%</td>
</tr>
<tr>
<td>Provide reserves electronically</td>
<td>18.8%</td>
<td>36.6%</td>
<td>50.8%</td>
</tr>
<tr>
<td>Add more computers in the library</td>
<td>8.6%</td>
<td>20.1%</td>
<td>54.5%</td>
</tr>
<tr>
<td>Provide training in use of Web/library resources</td>
<td>28.3%</td>
<td>27.4%</td>
<td>47.5%</td>
</tr>
<tr>
<td>Increase library hours</td>
<td>17.0%</td>
<td>37.5%</td>
<td>41.9%</td>
</tr>
<tr>
<td>Preserve library materials</td>
<td>40.0%</td>
<td>34.9%</td>
<td>24.7%</td>
</tr>
<tr>
<td>Add group study/seminar rooms</td>
<td></td>
<td></td>
<td>35.5%</td>
</tr>
<tr>
<td>Provide consultation on how to do library research</td>
<td></td>
<td>13.3%</td>
<td>39.8%</td>
</tr>
</tbody>
</table>

(All priorities listed that received at least 30% from any one group)
Table 8. LibQUAL+ Collections Expectations/Perceptions.

<table>
<thead>
<tr>
<th>Question</th>
<th>Faculty Minimum</th>
<th>Faculty Perceived</th>
<th>Grad Minimum</th>
<th>Grad Perceived</th>
<th>Undergrad Minimum</th>
<th>Undergrad Perceived</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. Resources added on request</td>
<td>6.23</td>
<td>6.10 (-.13)</td>
<td>6.04</td>
<td>6.27 (.23)</td>
<td>5.97</td>
<td>6.37 (.40)</td>
</tr>
<tr>
<td>17. Timely document delivery/ILL</td>
<td>6.41</td>
<td>6.82 (.41)</td>
<td>6.61</td>
<td>7.22 (.61)</td>
<td>6.31</td>
<td>6.88 (.57)</td>
</tr>
<tr>
<td>25. Full text delivered electronically</td>
<td>6.32</td>
<td>5.84 (-.48)</td>
<td>6.20</td>
<td>6.16 (.04)</td>
<td>5.96</td>
<td>6.24 (.28)</td>
</tr>
<tr>
<td>27. Comprehensive print collections</td>
<td>6.30</td>
<td>6.64 (.34)</td>
<td>6.63</td>
<td>6.65 (.02)</td>
<td>6.14</td>
<td>6.98 (.84)</td>
</tr>
<tr>
<td>36. Interdisciplinary needs addressed</td>
<td>5.89</td>
<td>6.44 (.55)</td>
<td>6.24</td>
<td>6.55 (.31)</td>
<td>6.05</td>
<td>6.65 (.60)</td>
</tr>
</tbody>
</table>

Means of minimum service level and perceived level of service are shown along with mean gaps between the two in parentheses.

Table 9. LibQUAL+ Library as place.

<table>
<thead>
<tr>
<th>Question</th>
<th>Faculty Minimum</th>
<th>Faculty Perceived</th>
<th>Grad Minimum</th>
<th>Grad Perceived</th>
<th>Undergrad Minimum</th>
<th>Undergrad Perceived</th>
</tr>
</thead>
<tbody>
<tr>
<td>14. Comfortable and inviting location</td>
<td>5.08</td>
<td>6.12 (1.04)</td>
<td>5.72</td>
<td>6.12 (.40)</td>
<td>5.98</td>
<td>6.73 (.75)</td>
</tr>
<tr>
<td>21. Secure and safe place</td>
<td>6.77</td>
<td>7.51 (.74)</td>
<td>6.81</td>
<td>7.26 (.45)</td>
<td>6.80</td>
<td>7.23 (.43)</td>
</tr>
<tr>
<td>22. Center for intellectual interaction</td>
<td>4.16</td>
<td>5.31 (1.15)</td>
<td>5.20</td>
<td>5.79 (.59)</td>
<td>5.75</td>
<td>6.24 (.49)</td>
</tr>
<tr>
<td>29. Space for group/individual study</td>
<td>4.57</td>
<td>5.94 (1.34)</td>
<td>5.90</td>
<td>6.07 (.17)</td>
<td>6.20</td>
<td>6.78 (.58)</td>
</tr>
<tr>
<td>30. Haven for quiet and solitude</td>
<td>4.74</td>
<td>6.02 (1.28)</td>
<td>6.12</td>
<td>6.08 (.04)</td>
<td>6.53</td>
<td>6.46 (.07)</td>
</tr>
<tr>
<td>40. Space that facilitates quiet study</td>
<td>4.69</td>
<td>5.75 (1.06)</td>
<td>6.23</td>
<td>6.30 (.07)</td>
<td>6.52</td>
<td>6.62 (.10)</td>
</tr>
</tbody>
</table>

Means of minimum service level and perceived level of service are shown along with mean gaps between the two in parentheses.
Remote Use

The 1995 UW Libraries’ survey revealed for the first time that, among faculty who said they used the library at least weekly, more were doing so remotely than physically visiting the library. This trend continued in 1998, and Table 10 shows degrees of remote use among all groups both in the 1998 survey and LibQUAL+. Responses to other survey questions in 1998 revealed that more than 97 percent of faculty had access to the Web through a desktop computer. While remote use is not itself a measure of service quality, this information is critical for planning and delivering electronic services and resources.

In general, LibQUAL+ results tended to correlate with results from the libraries’ surveys which had a much larger number of respondents for each group, especially faculty. Differences between groups, especially

<table>
<thead>
<tr>
<th>Type of Library Use</th>
<th>Visit in Person</th>
<th>Visit Remotely Using Computer</th>
</tr>
</thead>
<tbody>
<tr>
<td>LibQUAL+ Faculty</td>
<td>54.5%</td>
<td>81.1%</td>
</tr>
<tr>
<td>1998 Faculty</td>
<td>47.3%</td>
<td>73.4%</td>
</tr>
<tr>
<td>LibQUAL+ 1998 Grad</td>
<td>77.0%</td>
<td>80.2%</td>
</tr>
<tr>
<td>1998 Grad</td>
<td>77.9%</td>
<td>66.1%</td>
</tr>
<tr>
<td>LibQUAL + Undergrad</td>
<td>66.7%</td>
<td>48.8%</td>
</tr>
<tr>
<td>1998 Undergrad</td>
<td>70.3%</td>
<td>45.5%</td>
</tr>
</tbody>
</table>
faculty and undergraduates, that were evident in earlier UW Libraries' surveys, were also found in the LibQUAL+ results.

Subgroup Analysis

One of the benefits of a large respondent pool is the ability to do analysis on differences within the group. While there may be a set of similar characteristics that define a group, there may also be significant variation within that group. Academic user communities are not homogeneous in the way they use libraries nor in their needs for library resources and services. In addition to differences between faculty and students, there may also be significant differences between those in different academic areas or by gender or some other demographic component. These have important implications for identifying user needs, concerns, and issues that may be missed in analyzing aggregate results.

The number of respondents to the UW Libraries' 1998 survey, especially for faculty, was sufficiently large to examine the degree of variation within the group and between subject areas. The sample size and response rates of the LibQUAL+ survey generally precluded analysis by academic area and made it difficult to find differences among demographic characteristics. Increasing the LibQUAL+ sample size and the response rate would provide larger data sets that could be used to examine variation within and between groups. Factors related to the low response rate for LibQUAL+ include survey length, complexity (e.g., the three-column response), perceived redundancy, technical problems, behavioral issues associated with Web-based surveys, and how related survey content is to actual library use and issues of the respondent. While the LibQUAL+ sample appears representative of each group as a whole, it is not large enough to perform subgroup analysis.

How important is it to have a respondent pool large enough to do analysis at the subgroup level? UW Libraries' surveys have consistently shown significant differences in how faculty from different academic areas use libraries and in their needs for library resources and services. They also show surprising uniformity in areas such as connectivity and remote use where differences might be expected based on traditional use patterns. Although graduate student response numbers are lower, they were similar to faculty in the same academic areas.

Satisfaction responses, while showing some variation, generally do not differ significantly by academic area. Priorities, on the other hand, clearly do as shown in Figure 2. The 1998 results showed significant variation among academic areas in the top four overall priorities, especially for delivery of full text to the desktop and preservation.

Variation within undergraduate responses to the UW Libraries' 1998 survey were more difficult to determine. There were some gender differences, especially in areas related to computer access and library instruc-
tion as well as differences by class year. Figure 4 shows the importance of UW Libraries and the World Wide Web to the work of undergraduates by year in school. The differences between first year and upper division students were significant at the .05 level using a simple t-test. However, LibQUAL+ survey results did not show any statistical differences in responses either by gender or class year.

The importance of different resource types such as journals, books, bibliographic databases, and foreign language materials also showed significant variation between academic areas. When asked to rank these resource types on a scale of 1 (not important) to 5 (very important), faculty in all academic areas ranked journals as very important (ranging from 4.37 in Fine Arts to 4.97 in Dentistry).
A large number of responses also enables analysis within smaller subgroups. For example, the 1998 faculty survey had 241 responses from those in science departments. Table 11 shows mean scores by department on responses to questions dealing with type and frequency of library use and importance of resource types. Only departments with at least twenty responses were included.

Table 11. 1998 Survey (Faculty). Importance of Resource Types.

<table>
<thead>
<tr>
<th>Department (responses)</th>
<th>Books</th>
<th>Journals &gt; 1980</th>
<th>Journals &lt; 1980</th>
<th>Bibliographic Databases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry (56)*</td>
<td>4.28</td>
<td>4.83</td>
<td>3.92</td>
<td>4.39</td>
</tr>
<tr>
<td>Geology-Geophysics* (22)</td>
<td>4.54</td>
<td>4.91</td>
<td>4.27</td>
<td>4.18</td>
</tr>
<tr>
<td>Math-Stat (37)**</td>
<td>4.89</td>
<td>4.89</td>
<td>4.57</td>
<td>3.51</td>
</tr>
<tr>
<td>Physics (39)*</td>
<td>4.21</td>
<td>4.56</td>
<td>4.08</td>
<td>3.69</td>
</tr>
<tr>
<td>Psychology (24)</td>
<td>4.13</td>
<td>5.00</td>
<td>3.75</td>
<td>4.42</td>
</tr>
<tr>
<td>Zoology (27)</td>
<td>4.11</td>
<td>5.00</td>
<td>4.50</td>
<td>4.63</td>
</tr>
<tr>
<td>All Science (241)</td>
<td>4.26</td>
<td>4.76</td>
<td>4.09</td>
<td>4.05</td>
</tr>
</tbody>
</table>

(Mean scores, scale of 1 not important to 5 very important)

While current journals are important to all groups, the importance of books, earlier journals, and bibliographic databases showed variation within each group. Understanding the importance of these resource types to different subject areas is useful in allocating the collection-development budget as well as making decisions on what materials to house on-site or in storage.

There were also significant differences in the frequency of physical visits to the library by science faculty. Perhaps it is not surprising that distance from the library appeared to play an important role. Not only did the departments located closest to their primary library visit those libraries more often, the frequency of their physical visits exceeded the frequency of library use from an office computer.

A comparison between large-scale user surveys done by the UW Libraries and the LibQUAL+ survey administered to UW faculty and students shows good agreement in population representation and in broad result categories at the group level. However, the ability to do subgroup and intragroup analysis can provide valuable results and efforts to increase the number of responses if the Web-based LibQUAL+ survey should continue.
ASKING THE RIGHT QUESTIONS

Whether the survey results are statistically reliable, representative, valid, or significant, doesn’t necessarily mean that they provide information that can be used to assess and improve library service quality. It is also important to examine whether these surveys are asking the right questions in the right way to the right group. Survey design is a complex and evolving process that requires substantial interaction between the surveying group and the surveyed population. At many large academic research institutions, user communities are diverse and differ in their needs for library resources and services. It is essential to recognize that these differences exist when designing and administering surveys. Undergraduate students, based on their understanding of experience, may respond quite differently from faculty to some questions, making it difficult to do cross group comparisons. It is also important to remember that surveys are just one method of acquiring user input. While surveys offer the prospect of obtaining quantifiable data from large populations at reasonable costs, they need to be employed in the right situation. Surveys should be designed from the user perspective. Questions should be short, simple, and clear to the user. Complex issues may be better addressed using other techniques. There should be sufficient motivation for faculty and students to take the time to complete a survey.

The evolution of SERVQUAL to LibQUAL+ is a positive step. The ability to move away from the twenty-two question SERVQUAL core package to a design that provides a library focus, and perhaps a simpler format, is welcome. Grounding the survey based on user-provided information on library needs and use is critical to maintain currency and relevancy (Cook & Heath, 2000). Such qualitative data obtained at regular intervals enables the library to keep on top of user issues and concerns. The library and information environment is changing rapidly. The continued growth in remote use of library services and resources and in user self-sufficiency calls for new ways to measure user needs and library performance that can be done quickly, inexpensively, and flexibly enough to catch environmental changes. The ARL New Measures Initiative plans to provide libraries with tested tools that can help provide information that will assist in meeting these challenges.

The underlying concept of developing a standard instrument to measure service quality across libraries is a powerful one and certainly one deserving institutional support. However, it cannot supplant local efforts to work closely with faculty and students to assess user needs and library collections and services. There are local issues at each institution that probably cannot be effectively addressed in a standardized survey tool.

The University of Washington Libraries expects to continue both its participation in LibQUAL+ as well as utilizing a variety of ways to assess
user needs and library performance, including the deployment of locally based large-scale user surveys.

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Usage of Academic Libraries: The Role of Service Quality, Resources, and User Characteristics

Patience L. Simmonds and Syed Saad Andaleeb

Abstract

Competitive pressures from different information providers; widely available information resources; rising costs of books, serials, and electronic resources; and emerging new technologies and services providing information to potential library users raise questions about the role of academic libraries in present times. There has been some deliberation about the necessity to better understand and define the needs and expectations of library users to provide the appropriate kind and levels of service to provide satisfaction and service quality. But whether satisfaction with services is likely to explain the use of actual facilities is a moot question—i.e., the link between user satisfaction and usage of the brick and mortar facilities may be tenuous. This study proposes and tests a model to explain the use of academic libraries. The explanatory factors include service quality factors, resources, and user characteristics. Students in three academic libraries were surveyed in Erie, Pennsylvania, over a period of three semesters. Of the 210 questionnaires that were distributed, 188 were returned. The model was significant and explained some of the variation in library usage.

Introduction

The academic library has been described as the “heart” of the learning community, providing a place for students and faculty to do their re-

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search and advance their knowledge. The librarians and library staff provide numerous services to these users, addressing their diverse needs, characteristics, and interests.

However, with the advent of online catalogs, CD-ROMs, online databases, other electronic resources, new methods of document delivery, and access to information, the role of the academic library has begun to change. Students do not have to be physically present in the library in order to access the library’s resources. With the Internet and the availability of new technologies and numerous indexes, abstracts, and databases, the range of services that academic libraries can provide has increased dramatically. Users can access the libraries’ resources without stepping into the library building. They can easily access other libraries’ resources, such as online catalogs and unrestricted databases. The Internet has opened the resources of libraries to students and faculty worldwide.

The new technologies and electronic resources available today raise the question whether the library as a place has become a dinosaur. Do users need a physical library if almost everything can be accessed electronically? Are students still using libraries the way they are supposed to use them? How many students actually still use the library and why? And consequently, should librarians play a different role from what they have always played, especially if libraries are becoming mere data warehouses? In fact, many librarians today do not exactly know their users because of the changes introduced by technological advancements. It was easier when library users walked through the doors of the library, and the library staff could actually take some sort of count of these users. The library staff was also able to develop a library-user relationship with some of the users. Today it is far more difficult to say for certain how many of their students actually visit the physical library to use the resources. It is also difficult to estimate how many utilize the services and expertise of the library staff in the library building.

With emphasis being placed on electronic resources, and users being more interested in access rather than actual ownership, libraries are facing greater competition from many sources like bookstores and information from publishers and vendors who try to provide some of the same services that libraries provide. These competitors sometimes provide their services faster and more efficiently, while virtual libraries are easily available through the Internet. Some students also seem to know more about other libraries than their own institutions’ libraries.

By providing quality services and satisfaction to users, academic and research librarians can distinguish their services through friendly, helpful, and knowledgeable advice and the best technological resources available. Because academic library users have varying needs and expectations, it is the responsibility of the library staff to know these needs and expectations and strive to meet them. In this regard, Millson-Martula and Menon
(1995) maintain that one of the elements of quality service is when users' personal needs and expectations are incorporated into the development of programs and services of libraries. Whether this will lead to greater usage of library facilities is, however, unclear given the options available to the users. This research, therefore, addresses the usage of academic libraries. In particular, it addresses the role of service quality and other factors offered by an academic library to explain library usage.

**Literature Review**

Much has been written about access and ownership, but there has not been very much written about the factors that influence students actually to use libraries. Some of the library and information science literature examines library usage and academic success. Other researchers examine library use and instruction, while still others discuss library skills, usage, and grade point average.

Studies focusing specifically on usage of libraries by students are few. Jennifer Wells (1995) states that, “the effectiveness of libraries has often been measured by the volume of library materials available to clients, the amount of use of services and resources, and the apparent or quantified satisfaction of clients. Very little research has taken into account the objectives of the clients” (p. 121). Wells’s article deals mostly with library usage of undergraduate students and their academic achievements. She examines the number of times each student visited the library and whether there was any correlation between the library visit, the grades achieved, and the diversity of resources the student used in the library. Her study does not ask the students why they use the library, but what resources and services they used in the library, and the impact these had on their academic success.

Other sources discuss library use by different categories of students. According to Onwuegbuzie and Jiao (1997), “libraries represent one area in which international students have to adjust. The previous library experiences of these students is a critical determinant of how much adjustment to the United States library system is needed” (pp. 258-59). Some of the reasons why international students used the library include: studying for tests, reading books on reserve, checking out books, using computerized indexes and online facilities, and meeting friends. These library usage characteristics of international students are also pertinent to other students.

Providing quality services in academic libraries is now a major issue among academic librarians; they see the library more in terms of the provision of and access to service quality than as just a physical place. Technology and automation have also changed the way people perceive libraries. As a result, the role of libraries and librarians is also changing. Librarians themselves have been re-evaluating their role as reflected in many
discussions and papers. They emphasize the provision of good library service as more important to the user than the mere physical library building. This perspective is evident in several recent studies (Edwards & Browne, 1995; White & Abels, 1995; Hernon & Calvert, 1996; Nitecki, 1996; Coleman et al., 1997). Access to information provided by libraries is seen as more important than the materials physically available in a library. According to Birdsell (1994): “The electronic library operates within an electronic collaborative environment with an emphasis on access to information regardless of its location” (p. 41).

Andaleeb and Simmonds (1998) identified several factors that influenced user satisfaction; these factors included responsiveness, competence and assurance (which translated to demeanor), tangibles, and resources. However, they did not investigate whether quality services leads to increased usage of the library itself. This study examines whether, and the extent to which, service quality factors along with resources and user characteristics affect library usage.

**Research Data and Constructs**

This article is based on data collected earlier for a different study (Andaleeb & Simmonds, 1998) in which the researchers examined the relationship between library service quality factors and user satisfaction. While this study is based on the same data set, it explores the links between service quality factors, resources, and user characteristics to library usage. Library usage is defined as users’ beliefs about the extent to which they use library facilities. It was measured on seven-point Likert scales using two items: “I use my library a great deal” and “I spend a lot of time at the library.” The coefficient alpha of the two-item scale was .83. The other constructs and their measures were retained from the earlier study (see Andaleeb & Simmonds, 1998).

**Research Methodology**

The researchers first consulted secondary literature to find out what had been written on library service quality and user satisfaction. Information was also directly gathered from people who used the library during the research period. People were interviewed in depth about their perceptions of library service. Participants taking part in this pre-study were presented with open-ended questions, which allowed them to express their opinions fully. Since the interviews with these participants were thorough, the researchers were able to explore “the diverse issues while narrowing the factors down to several important ones that seemed to best explain user satisfaction with library service” (Andaleeb & Simmonds, 1998, p. 159).

A questionnaire was designed, pre-tested, and then administered to approximately ten respondents using the services of the library at that time. The feedback enabled the researchers to improve questions relevant
to the study. The survey was revised based on the information provided by the participants in the pretest. Questions which were unclear or ambiguous to the respondents were eliminated, and the final version was distributed to the students.

**Sampling**

A total of approximately 210 questionnaires were distributed to all the participants using systematic sampling; 188 were returned. The survey was personally distributed by the researchers to student users who were physically in the library building at the time of the study. The survey was conducted over a period of one year and included data collected from spring, summer, and fall semesters. The demographic profile of the respondents is presented in Table 1. The response rate (89.5 percent) of the study was high. Respondents were assured of confidentiality. Furthermore, the letterhead of a very credible educational institution was used to assure respondents that the study represented institutional research. Respondents were also informed that key results would be made public. The above considerations may explain the reasonably high percentage of responses without follow-up.

**Results**

Multiple regression analysis was conducted using the five-factor structure used in the previous study and two additional variables—familiarity with the library and gender. While the full model was significant, not all independent variables were significant (see Table 2).

A restricted model was thus run with an F-statistic of 10.80 \( p < .001 \). The restricted model explained about 17 percent of the variation in the dependent variables as indicated by the R² value (see Table 3). It may be noted from Table 3 that each of the independent variables in the restricted model had a significant effect on library usage. Interestingly, only one of the service factors—tangibles—had a significant effect on library usage. There was also a marginal effect on the gender dummy variable with a 10 percent probability of making a Type I error (i.e., rejecting a true null hypothesis of no effect). This finding suggests that females use the library marginally more than males. Resources and familiarity with the library were also significant explanatory variables. An examination of the parameter estimates (especially the standardized beta values) suggests that one’s familiarity with the library had the greatest impact on library use, followed by resources, tangibles, and gender.

**Discussion**

This discussion suggests that the use of academic libraries is influenced most by a user’s perceived familiarity with the library and its resources; those who are more familiar with the library are more likely to use academic libraries. If library usage is to be increased, it is important
Table 1. Demographic Profile of Respondents.

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>91</td>
<td>48.4</td>
</tr>
<tr>
<td>Female</td>
<td>90</td>
<td>47.9</td>
</tr>
<tr>
<td>NA</td>
<td>07</td>
<td>3.7</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under 20</td>
<td>60</td>
<td>31.9</td>
</tr>
<tr>
<td>20-24</td>
<td>91</td>
<td>48.4</td>
</tr>
<tr>
<td>25-29</td>
<td>17</td>
<td>9.0</td>
</tr>
<tr>
<td>30-34</td>
<td>04</td>
<td>2.1</td>
</tr>
<tr>
<td>35-39</td>
<td>05</td>
<td>2.7</td>
</tr>
<tr>
<td>40+</td>
<td>05</td>
<td>2.7</td>
</tr>
<tr>
<td>NA</td>
<td>06</td>
<td>3.2</td>
</tr>
<tr>
<td>Educational Level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshmen</td>
<td>37</td>
<td>19.7</td>
</tr>
<tr>
<td>Sophomore</td>
<td>36</td>
<td>19.1</td>
</tr>
<tr>
<td>Junior</td>
<td>53</td>
<td>28.2</td>
</tr>
<tr>
<td>Senior</td>
<td>41</td>
<td>21.8</td>
</tr>
<tr>
<td>Graduate</td>
<td>14</td>
<td>7.4</td>
</tr>
<tr>
<td>Other</td>
<td>01</td>
<td>.5</td>
</tr>
<tr>
<td>NA</td>
<td>06</td>
<td>3.2</td>
</tr>
<tr>
<td>Majors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business</td>
<td>47</td>
<td>25.0</td>
</tr>
<tr>
<td>Science &amp; Engineering</td>
<td>43</td>
<td>22.9</td>
</tr>
<tr>
<td>Humanities &amp; Social Sciences</td>
<td>85</td>
<td>45.2</td>
</tr>
<tr>
<td>NA</td>
<td>13</td>
<td>6.9</td>
</tr>
</tbody>
</table>

that libraries find ways to familiarize users with the library. This might involve ongoing training as well as access to helpful and knowledgeable library staff. There is also the need for librarians to make sure that users know how to use library resources not only in the confines of the library building, but even when they access the resources remotely. Many students are now accessing library online catalogs and electronic resources remotely from their dormitory rooms, computer laboratories, home computers and, for some adult students, workplace computers. Even with basic library instruction, many users find it difficult to comprehend and manipulate the many complexities of information research. Many instruction librarians are aware of how easily users forget what is shown to them after the basic library instruction class. Whatever is taught to users in
Table 2. Regression Analysis: Full Model (Dependent Variable: Library Usage).

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>b</th>
<th>s.e.</th>
<th>B</th>
<th>p&lt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tangibles</td>
<td>.179</td>
<td>.092</td>
<td>.138</td>
<td>ns</td>
</tr>
<tr>
<td>Resources</td>
<td>.305</td>
<td>.181</td>
<td>.171</td>
<td>.05</td>
</tr>
<tr>
<td>Familiarity</td>
<td>.255</td>
<td>.089</td>
<td>.205</td>
<td>.01</td>
</tr>
<tr>
<td>Gender</td>
<td>.325</td>
<td>.174</td>
<td>.129</td>
<td>.1</td>
</tr>
<tr>
<td>Responsiveness</td>
<td>-.059</td>
<td>.100</td>
<td>-.052</td>
<td>ns</td>
</tr>
<tr>
<td>Demeanor</td>
<td>-.057</td>
<td>.142</td>
<td>.048</td>
<td>ns</td>
</tr>
<tr>
<td>Competence</td>
<td>.029</td>
<td>.156</td>
<td>-.022</td>
<td>ns</td>
</tr>
<tr>
<td>Constant</td>
<td>.022</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

R² = .172
F 7,179 = 5.28, p < .001

Table 3. Regression Results of Restricted Model (Dependent Variable: Library Usage).

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>b</th>
<th>s.e.</th>
<th>B</th>
<th>p&lt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resources</td>
<td>.305</td>
<td>.181</td>
<td>.171</td>
<td>.05</td>
</tr>
<tr>
<td>Familiarity</td>
<td>.255</td>
<td>.089</td>
<td>.205</td>
<td>.01</td>
</tr>
<tr>
<td>Tangibles</td>
<td>.179</td>
<td>.092</td>
<td>.138</td>
<td>.05</td>
</tr>
<tr>
<td>Gender</td>
<td>.325</td>
<td>.174</td>
<td>.129</td>
<td>.1</td>
</tr>
<tr>
<td>Constant</td>
<td>.022</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

R² = .17
F 4,181 = 9.07, p < .001

orientation or course-related instruction sessions has to be reinforced with other effective search techniques to make it easier for them to utilize those techniques when they are working independently away from the library environment.

Emphasis on instruction and knowledge on how to use these resources can help to increase library usage and also to enable them to evaluate more effectively the resources they find when they do research. Academic librarians often hear users say, "everything can be found on the Web." It is frustrating to try to explain to users that not everything can be found on the Internet that is research-worthy. Librarians should teach users how to
learn to distinguish between materials found on the Internet using typical search engines, such as Yahoo, Google, etc., and materials which libraries have purchased from vendors, but which can be accessed through the Web. Instruction on how to critically evaluate both print and electronic resources would also help users appreciate the multitude of sources currently available for research, and increase user satisfaction with academic libraries.

In addition to familiarity, it is also important to note that the perceived quality of the library's resources is a key variable explaining library usage. Because academic library users frequent their libraries to find solutions to their academic problems and needs, it is imperative that libraries have the right kinds of resources available; otherwise, users will go somewhere else. In today's changing environment, resources mean much more than the size of the library's collections. Access to resources may in fact be seen as vital to judging resource adequacy. Consequently, academic librarians must monitor the needs of the academic environment by remaining networked into their academic institution's curriculum, resource needs of teachers, student preference for how needed information is packaged (i.e., CD-ROMS, journals, microfiche, audio visuals, Internet, etc.), and related administrative use of information (i.e., career planning and development, and so on). By focusing on needed resources and delivering what users want, librarians can play a proactive role by developing a variety of resource access options for the users that meet cost and efficacy criteria.

The findings also suggest that library usage is influenced by tangibles—a clean and visually appealing library. Clearly, the physical appearance of the library must be made appealing to bring users to the facilities. This finding also suggests the need for additional studies that explore what constitutes "visual appeal." The findings should provide input to designers and refurbishers about architectural layout, color tones, amenities, and so on that enhance visual appeal. Some users in academic institutions find it extremely difficult to study or do any significant research in their dormitories. Many of them have problems with roommates, loud noises in their rooms, and so on. For them, and others in similar situations, the library is more conducive to research and studying. Some adult students in particular welcome the atmosphere of the academic library, which acts as a solace from their busy lives in the workplace, family lives, and other nonacademic obligations. Consequently, the library environment must be appealing to all users.

Curiously, responsiveness, competence, and demeanor of the staff did not have significant effects on library usage as indicated by the significance tests in the full model. Perhaps these variables work through other mediating variables to explain library usage.

The explanatory variables in the restricted model explained about 17 percent of the variation in the criterion variable. This is a clear indication
for additional research to identify other important variables explaining library usage. However, the model does suggest that librarians should focus on the significant variables until further studies are conducted and additional important variables are discovered.

To follow up on the low coefficient of determination, the correlations between the independent variables were examined for multicollinearity. These coefficients were low. Moreover, the high tolerance values (.852-.966) and the low values of the Variance Inflation Factors also indicated the near absence of multicollinearity. These assessments provide further indication that there are other variables, not included in our model, which should add to our understanding of library usage. Perhaps access to the Internet is a significant variable: those who do not have access are more likely to use the library while those who do might prefer to access information directly from their computers. Another factor that we hypothesize is perhaps the cost of access to information. If electronic access to needed materials represents a significant cost (either because of costs of going online or because of charges that are directly proportional to the amount of information requested), library usage may be greater. These conjectures must be tested in future research. If academic librarians are interested in producing lifelong learning through instruction on how to use library resources, then they must actively examine the needs and expectations of library users and aim to fulfill these.

REFERENCES
Beyond Measuring Service Quality: Learning from the Voices of the Customers, the Staff, the Processes, and the Organization

Shelley Phipps

ABSTRACT
As ARL libraries begin seriously to assess how well they are anticipating, meeting, and delighting students and faculty, the primary focus should be on understanding customers’ needs, learning quick and clean methods of data gathering and analysis, improving critical processes, and developing internal capacity to be successful in the future. To transform the work and how it is accomplished, libraries must begin listening and acting on the voices of customers, staff, work processes, and the organization for the purpose of learning new directions and partnering with customers.

The purpose of sharing macro data among ARL libraries should be to provide benchmarking information for the overall improvement of academic libraries. The purpose of gathering service quality data should be to identify what is working well and what is not and to increase knowledge of customer requirements. Data gathering must be easy, meaningful, and clearly related to customer satisfaction for staff to commit to using performance measures. Involving staff in strategic library-wide and unit level strategic planning will be key to building this commitment. Methodologies, such as LibQUAL+, can work as “pointers” to the need to study specific processes. Gathering data from the process itself is one of the most efficient methods for measuring performance and is also useful for helping staff recognize the need to change and enhance services. Using these data to develop performance and learning goals supports continuing customer focus. As the customer perspective is integrated into planning and

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decision-making, practicing the disciplines of the learning organization will ensure the development of the organizational capacity to respond to this new picture of reality.

INTRODUCTION

As the Association of Research Libraries undertakes the development of "new measures," the intent and expected outcomes must be clear. This new initiative involves more than the application of new measures. The effect of this effort appropriately includes the design of new methodologies that focus libraries on customers. It is recognition that customers are key partners in our enterprise and will, in fact, determine the future of research libraries. Collecting data from and about customers will help in the design and development of the future mission critical work processes and service priorities of academic research libraries—many of which may not be in the current portfolio or are not appropriately staffed and organized for the greatest efficiency. As these new methodologies are examined, it is critical to recognize that they are part of a major culture change for libraries. Satisfaction and other customer data, such as needs assessment results, will be gathered that have major relevance and meaning for staff and a change in the organization of work. Previously, ARL input data was understood and shared within a small group of administrators who drew assumptions from it and who created administrative budget strategies at the campus level to justify funding increases. The utilization of outcome data from the customers' perception of expected service quality should lead to a wider sharing and internal use of this information for the purpose of improving processes and to engage in formal organizational learning.

Service quality measurement is but one step in the process of transforming libraries so they can participate as full collaborators and leaders in the necessary and positive transformational changes in higher education. The library of the twenty-first century must be a new entity. Educating staff in the utilization of new measures will increase the required capacity for organizational learning that will support the creation of this new library.

Leading in these new directions will be challenging. Different leadership skills and different organizational systems that support staff in their efforts to understand and embrace these changes will be critical to success. Staff will need to re-focus their efforts on performance for customers; redesign work to be cost-efficient and of improved quality; and develop new analytical, technical, and teamwork competencies that will enable future success.

The need for culture change is clear and fundamental. Despite claims to the contrary, academic libraries are internally focused—choosing and planning work priorities based on present competence, traditional work
processes, and limited resources. Analysis of results for customers is not a common practice. There is an underlying fear that expectations may develop that cannot be met. Libraries often have been content with meeting minimum expectations. Through LibQUAL+ and needs assessment instruments, the “desired” expectations, as regards level of service quality and new services, will be more fully understood. Without this understanding, the capability to be viable in the future will be limited. Desired expectations are changing rapidly in the technology-enabled environment within which library services are offered. There is a real possibility that the corporate world will develop the capabilities to appear to exceed even the highest expectations of library users. There is a danger that this will result in a shift of resource allocation and customer loyalty. As faculty and students perceive that the retrieval of relevant information from alternate sources is easier, faster, and sufficient for their present needs, their support of the library, as central to research and teaching, will diminish. The private sector competition has and will continue to recognize the market share to be gained from this customer group, and libraries as they are presently configured will increasingly be marginalized within the educational and research process.

Despite concern and some progress on implementing improvements, in many libraries, present work processes are not cost efficient, and the allocation of resources does not reflect strategic preparation for this radically different future. There is a lack of understanding of how work can be organized to avoid bottlenecks, backlogs, and redundancy. There is little awareness of the actual time or cost involved in delivering products and services. There are too many positions devoted to unnecessary supervision, management, and administration. The need for resource reallocation is understood, but the skills to conduct cost studies and lasting quality improvement initiatives are lacking within the profession.

New measures and a focus on customers are first steps in the right direction for inventing the future libraries that future customers will need. The development of a new culture of research librarianship is critically intertwined with these new initiatives. In this new customer-focused culture, every staff member cares about results. They partner with customers and seek to understand what is needed now and in the future. They know what future to prepare for and know when their work is progressing toward desired results. They know how to analyze their work processes for continuous improvement. All staff members make radical changes in how they organize and manage their work processes, and they learn the new skills and knowledge required for new services and products. And last, they are fully supported by an organization designed to tap their full potential and commitment and reward their efforts to succeed.

This article will examine these four aspects of culture change: (1) listening to the voices of the customers by developing cooperative
partnerships with them; (2) listening to the voices of the staff by creating systems that support staff performance for the future; (3) listening to the voice of the process by learning continuous improvement methodologies to identify whether work processes are effective and efficient; and (4) listening to the voice of the organization by turning libraries into organizations focused on creating the desired future and maximizing the capacity to achieve it.

**LISTENING TO THE VOICE OF THE CUSTOMER: DEVELOPING COOPERATIVE PARTNERSHIPS WITH CUSTOMERS**

The advent of the globalization of the market economy has been described as the customer’s victory. “We are moving from a long-standing period in which what was scarce was the product, to a period where what is scarce is the customer” (Dupuy, 1999, p. 38). No longer can successful organizations focus inward on their own capabilities and processes; they must understand the complex relationship they have with customers and cooperate with them to develop new products and continuously improve according to changing demands and technological potential. Libraries have moved from an environment where they had a virtual monopoly on information access to one where databases, Web resources, and vendors are plentiful and customers have choices. Libraries are no longer the sole providers of access to comprehensive collections of research articles. Electronic and print books are available from dot-com enterprises with a faster turnaround time than libraries have traditionally provided. Information that appears to be relevant, accurate, and timely abounds on freely accessed Web sites. This has led to the need for the development of a formal and extensive capacity to listen to customers and to become listening organizations. “Listening (in our organizations) is a set of behaviours, of arrangements, of co-operative efforts; it includes how employees’ careers evolve, and through this their status in the company, their benefits, their privileges. In order to truly listen to the customer, one must begin by taking a closer look at all of these various domains. In many cases, listening can be quite painful” (Dupuy, 1999, p. 43).

It is critical to recognize that academic research libraries are part of the global economy. One need only look at the effect of Internet access to Web-based information on reference services in academic libraries; at the complexities of the competing economic models of “ownership” among international publishing conglomerates, vendors, authors, and libraries; at the progressive evolution of “distributed learning” and the creation of “internet universities”; or at the current challenge faced when recruiting and retaining the technologically talented. The content (information), the methodologies (technology), and those employed (staff) within the library business, are affecting and affected by the globalization of the economy. Commitment to professional values and a service and educa-
tional ethic is foundational in this changing environment. Survival is an explicit goal in an era of competition if there truly is a value-added quality to the library's contribution to the educational enterprise that must be preserved.

**LibQUAL+: A First Step in Developing Cooperative Partnerships with Customers**

The adaptation of the LibQUAL+ instrument is a key initiative that is critical to learning what is important to customers and how they perceive library services in relation to their expectations. First, it represents the first national effort on the part of research libraries to focus directly on the voice of the customer—to move from the inward focus on inputs and production capability to outputs and outcomes. Second, it has been designed and piloted in the spirit of sharing benchmarking information among cooperating libraries. This is a welcome new direction from “colleague competition” toward an expanded view of academic research libraries as part of a larger system engaged in cooperation in an environment that is increasingly characterized by boundless/placeless opportunities for offering higher education.

LibQUAL+ also creates a new culture of cooperation by providing incentive to redefine relationships with the benchmarking partners. LibQUAL+ provides information that can lead to widespread improvement in research libraries nationally and internationally. In order to compete with the growing capability of the corporate world to serve library customers, LibQUAL+ enables us to learn from one another and share successful approaches. It also provides a connection with the combined set of customers that demonstrates a caring attitude, an expectation for feedback, a commitment to quality improvement, and a dedication to partnering in transforming the educational process.

LibQUAL+ must be used as it is intended—as learning from the voices of our customers—at the macro-level. The goal is to develop a valid reliable instrument for pulse-taking, for eyeballing, for gaining a picture at the 30,000 feet level, of what customers view as important and how they experience the library's capability to meet their needs.

“Unfortunately, marketers in the 1990s seem to have developed a form of 'satisfaction myopia' too often focusing on the physical characteristics of their product or service offerings rather than the benefit (or satisfaction) delivered to consumers. Whenever such a misorientation is present, customer satisfaction is likely not to be a top priority” (Vavra, 1997, p. 12). One of the valued attributes of the LibQUAL+ approach is that it provides an opportunity to test how the customer defines satisfaction and moves from our own internally focused definitions of success. Ultimately, success, in the form of customer loyalty and vocal support for budgetary requests, will be measured by the perception of the positive difference made.
in the research, teaching, and learning processes on campus. LibQUAL+ provides one important view into those perceptions.

It will be critical, however, to construct and apply additional methods for informing the summary data from LibQUAL+ surveys. It would be unfortunate if results were used to draw inferences or conclusions based on this macro-data without recognizing that assumptions and beliefs of the current culture limit and skew the interpretation. Testing the macro-data with various subcommunities of customers, letting their voices describe their problems, barriers, needs, and wants, must be the next steps after reviewing the results of this comprehensive broad survey. The macro-data gives clues. This is helpful. The aggregated responses may be a symptom of a very different problem than what may be initially assumed. The actual response may be related or not to the specific dimension on a radar chart display. For example, a question related to “Full-text delivered electronically to individual computer” is contained in the dimension, access to collections, where respondents in the pilot data indicated performance as less than expected. Is the problem that the electronic material is not owned? Or is there difficulty in using the access systems designed by the library or provided by vendors? Or, is the problem the lack of staff support for mounting reserve material? Or, is the problem related to lack of tangibles in external campus offices—computers that can network and download? What kind of full texts do customers expect to be delivered—books as well as journals? The answers could be all, some, or none of these. Without testing the assumptions about the macro data, little can be learned regarding the particular need and the appropriate response.

Another example of the need to collect more granular data can be noted in a question about “Complete runs of journal titles”—where, in the summary aggregate pilot data, the pilot group fell below minimum expectations. Are “complete runs” wanted at the expense of monograph titles? Are the respondents utilizing the complete runs recently purchased from electronic vendors? Are they aware of these electronic full runs or do they want them in print? Have they been frustrated, recently, by some missing issues in one or two journals they use heavily?

In these examples, LibQUAL+ points a finger in a direction that needs further research. It is only by feeding back the summary data to specific different customer groups and individuals that the picture will gain clarity. Seeking the assumptions behind their responses, listening to their descriptions of their experiences, and understanding their personal and cultural perspective is a critical next step. Then the professional knowledge and larger system picture within the library, the values and vision, and the understanding of the total environment in which the library must choose priorities and make decisions, needs to be brought to bear. This larger context includes financial impact assessment, strategic implications, publishing trends, technological capabilities, competing customer de-
mands, staff competencies, and the service quality capabilities of established processes. In this entire context, there can be an assessment of what must be done to improve the ratio of customer expectations to their perception of current library performance. The goal must still be to improve the ability to satisfy the customer, but the many variables involved will be clarified and the strategic actions chosen will be based on the reality of their needs. Innovative alternatives might be designed that go well beyond original customer expectations. The vision, values, and unique competence contributed by the library to the educational process will be a part of the solutions developed. An example of the importance of specific follow-up resulting in a more innovative service than originally expected by faculty is the offering of access to electronic journal articles. If responses showed dissatisfaction with “complete runs of journal titles,” and the actual concern in specific departments related to the lack of access to important back files, the approach taken by the library would not be the same as if the problem was the lack of actual titles judged important to current research in the field. The library might develop new consortial agreements to address the first issues, but it may purchase new electronic databases that drastically improve accessibility to current literature in a field to address the latter. The financial implications of the two solutions differ greatly.

Following up on LibQUAL+ information also provides an excellent opportunity for developing meaningful cooperation with customers. Validating their experience from their point of view, genuinely seeking understanding, sharing the library’s perspectives—both the limitations presently faced as well as the commitment to creatively reduce those limitations—can lead to a collective effort, with loyal customers, to expand the library’s capabilities. What personal experience demonstrates and the original SERVQUAL research indicates is that customers want prompt service and employees who are courteous, knowledgeable, and inspire trust and confidence (Parasuraman, Zeithaml, & Berry, 1988, p. 23). Customers do not always expect an instant response with 100 percent quality or 100 percent availability. Customers of libraries do expect to be able to utilize services and collections to be successful in their teaching, research, and learning. It is from this perspective that they respond to surveys such as LibQUAL+. Demands on their time and expectations for their own work influence their desire for reasonable wait times, increasing ease and reliability, and increased access to resources. They are also influenced by their awareness of the current capabilities of technology (Osborne, 2000, p. 347). What they expect as they interact with other retail and service industries, they are highly likely to expect of libraries. LibQUAL+ provides an excellent opportunity to listen to the voice of customers; establish proactive caring relationships; and gain customers’ cooperation in increasing the capacity of libraries to meet their expectations in the future.
LISTENING TO THE VOICE OF THE STAFF: CREATING SYSTEMS THAT SUPPORT STAFF PERFORMANCE FOR THE FUTURE

Once customer needs are understood, at the macro and more detailed levels, we need to listen to the voice of the staff in libraries. If caring to succeed with customers is going to permeate the new culture, organizational systems that support staff efforts need to be designed and implemented with staff members’ full involvement. These systems need to support staff to focus on performance, know how to measure progress, and help them develop the new knowledge and skills needed to improve service quality. Key systems need to be integrated into the organizational structures to develop this new culture:

- a strategic planning system that fully involves and utilizes the knowledge and experience of staff, and
- a performance effectiveness management system that provides support for goal setting, measuring, and positive support for performing and learning.

ENGAGING STAFF IN LIBRARY-WIDE STRATEGIC LONG-RANGE PLANNING

It will be very difficult in this complex and ever-changing environment for a few “hero-leaders” to determine the strategies necessary for success with customers and stakeholders. Expectations change quickly. Trends develop in months rather than years. If only those in administrative positions analyze data, scan the environment, and promulgate the plans, widespread organizational commitment will be less than sufficient, agility will be hampered, and the ability to proactively create the necessary future will be limited. It is the staff and librarians on the front lines who will form these partnerships with customers. The entire organizational competence must be utilized. All staff must be involved to plan successfully for the future.

Leaders must design and implement databased, customer-focused, strategic planning processes that involve staff in order to increase staff commitment to engage in the many new efforts that will have the most important strategic impact on outcomes for customers. Staff must be involved in learning about customer needs, current dissatisfactions with the whole library, and future customer priorities as part of strategic planning. Cross-functional efforts to identify and reduce the “biggest” barriers to customer success, or create new approaches to address the “highest” priority needs of customers, enable the organization to take advantage of the breadth and depth of competencies that exist in its various units. Giving staff the opportunity to serve on cross-functional teams outside the boundaries of their work unit, and utilize skills otherwise not recognized, or learn skills that will be needed in the future, will expand organizational
competence. Encouraging this level of commitment and involvement will also lead to the creation of promotion and compensation systems that will enable retention of those who are key to success in the future. As staff assume full responsibility for the various levels of the planning process, the organization taps into the full intelligence and creativity otherwise lost in a hierarchical planning process.

Staff-driven strategic planning processes such as Hoshin planning or management by planning, utilized at the University of Arizona, begin with an analysis of the current and future external environment, including analysis of customer input and assessment of needs. The strategic long-range planning team then sets five-year strategic goals with multi-year performance measures and annual targets for Quality Standards (see http://www.library.arizona.edu/library/teams/slrp/syllabus/measure.html). After the five-year plan is drafted or revised, an annual plan is developed. This consists of cross-functional and functional team projects focusing the year’s major critical work on preparing for the future, solving the biggest customer problems, and positioning the library to intentionally move forward toward the multi-year quality standards.

SUPPORTING STAFF IN CARING ABOUT PERFORMANCE AND LEARNING ABOUT MEASUREMENT

Research library organizations must design internal systems that help staff keep current with customer needs, understand the real causes for dissatisfaction, discover what would increase satisfaction, and focus staff efforts on improving services and creating new products. Library performance management systems need to support this staff focus on customers. The systems must call for staff to directly interact with customer groups, assessing needs and learning about concerns and service expectation shortfalls. The systems must also empower and encourage accountability at the work group level to perform and measure success from the customers’ viewpoint.

One effective way of doing this is to begin utilizing team or work unit structures that increase capability for success. Structures that increase shared accountability, foster interdependence and collaboration, provide for synergistic learning, and allow for increased innovation and productivity are called for (Katzenbach & Smith, 1993; Scholtes, 1998). Creating teams or work groups is not enough, however. In order to be high performing, teams must be provided with a formal framework for focusing and evaluating their efforts from the customer perspective. Helping teams to create a strategic performance framework will be most important, a framework in which team members gather data from customers, create quality standards, plan individual and team projects to meet these standards, and take ownership for measuring the results and for continuously improving.
Increasingly, libraries are asked by external stakeholders to define and account for success, to demonstrate positive outcomes, and to keep up with changing demands. Communicating this urgency to demonstrate actual outcomes to staff on the front lines is critical. The organizational infrastructures and performance systems created in the past do not facilitate this new mandate for external focus on measurement of results and continuous improvement. Traditionally, some departments—for example, serials, special collections, and media—were structured to organize or provide service around certain information formats—an internal focus. Others were structured to encompass certain work processes—such as reference, instruction, or access—that may limit thinking about alternative modes for delivery of customer service or actual priority needs of customers. As rapid changes occur in the environment, organizing principles are needed that anticipate the directions for changes and enable the creation and delivery of new service responses. The University of Maryland has created such a unit called “Service Plus” while others are developing “Information Commons,” perhaps leading to an infrastructure with a much clearer focus on outcomes and future customer needs that cannot be foreseen today. The important aspect of these units is that flexible staff with diverse talents, committed to a common service goal and an agreed upon approach, work together to understand needs, innovate if required, and offer high levels of service quality. These are the characteristics of full-fledged teams. Teams are accountable to customers and capable of solving problems without management directives. Using data, an understanding of good practice, and the library’s vision, teams are empowered to make decisions.

Teamwork that truly increases performance requires the development of new skills and abilities. Staff need to be trained and supported in the development of teamwork skills. Implementing a performance effectiveness management system that can guide staff in creating team quality standards from the customers’ point of view and help staff learn which data to use to measure progress and success is essential. In a customer-partnership culture, performance systems should guide staff to hold themselves mutually responsible for engaging in efforts to attempt to exceed customers’ expectations. Teamwork requires collaborative planning, synergistic learning, and accountability to measure results.

Many current performance systems have an inward focus. Goal setting processes start from “what is the present capability?” rather than “what does the customer group need the most?” A management by objective framework, which results in setting specific management-determined targets, in practice leads to limit-proscribed performance. Frameworks that focus teams on continuously increasing performance and expanding capabilities will better support the new culture where caring to exceed customer expectations is always the goal. Many performance appraisal sys-
tems focus on evaluation of past performance. Embedded in these systems is a foundation of reward and punishment. Systems are needed that focus on the future, on support for individual growth and learning, and on progress in developing positive relationships with, and outcomes for, customers.

The University of Arizona Library is attempting to move in the direction of this new culture by implementing a team-based Performance Effectiveness Management System (PEMS) (see Appendix). In the past, performance appraisals focused on individual ability and contributions based on existing expertise and specialization. Individual capability was delimited by "professional," "technical," "clerical," or "managerial" job classifications and hierarchical and departmental relationships. Goal setting examined internally determined measures of success as set by administration and/or negotiated with the department.

In the PEM, staff members engage in creating their teams' strategic frameworks and establish quality standards for service that would be expected by customers. There is a shared responsibility for utilizing the skills and talents of all members of the team to work toward meeting those standards. All members are encouraged to develop and apply new skills regardless of job classification. Teams increase performance through synergy, focusing on high quality standards, and paying explicit attention to defined performance measures (Phipps, 1999, pp. 114-15).

To succeed in such a new culture, teams or alternative work units must be guided by the organization's infrastructure and support systems to focus on continuous quality improvement. If systems are not in place to support a culture of assessment, staff will not be able, willing, and committed to utilize data to transform their work efforts as needed by changing customer demands.

Gathering, analyzing, and utilizing customer data is only one part of a larger complex transformational culture change that is needed to ensure the ability of academic research libraries to survive and compete. Staff must want to be successful for customers because of the intrinsic reward of being involved in making a meaningful contribution. Recruitment and hiring systems need to be effective at selecting staff with this potential motivation. Work goals and requirements need to help staff recognize that they are part of a whole that is carefully structured to contribute to the improvement of the educational and research processes of our campuses. Performance appraisal systems need to provide a continuous feedback loop that demonstrates to staff whether their efforts are successful in meeting customer needs.

The Performance Effectiveness Management System calls for teams and individuals to seek feedback to learn how to increase effectiveness and to focus on learning new knowledge and skills that will help the library be successful in the future. In this kind of performance system, data
are collected by the teams, and macro-data are analyzed by the whole staff. Individuals set goals aligned with team and library quality standards. Peer team members review each other’s progress with the intention of helping each other succeed. As individuals succeed in achieving their goals, the team succeeds with customers.

In the traditional hierarchical culture, data are collected and used in central administrative units. Indicators of problems or progress are not understood throughout the library. Recognition of possible trends or “red flags” does not permeate the organization and therefore does not usually drive the annual planning processes of the units. In this culture, those who are farthest from the customer utilize the data, largely for justifying budget increases, losing the opportunity to involve those who partner with and serve customers directly. As new measures are explored, it must be recognized that it is the efforts of staff that are being measured indirectly. They deserve to be involved in the interpretation and use of those measures to plan their work (for an interesting history of hierarchical organizational structure and its tenets, adapted from the Prussian Army and introduced to American business as a way to prevent train wrecks, see Scholtes, 1998, p. 2).

Team or unit and individual efforts are key to continuous improvement—using data as feedback help staff learn, grow, and increase performance that relates to customers’ changing expectations. Using these data to plan the year’s work is a key link to developing continuing partnerships with our customers.

LISTENING TO THE VOICE OF THE PROCESS: TECHNIQUES THAT ENSURE THAT WORK PROCESSES ARE EFFECTIVE AND EFFICIENT

Introduction and Background

Data from the LibQUAL+ instrument contributes to a fuller understanding of desired outcomes and emphasizes listening to the voices of customers. Designing systems that involve staff in strategic planning processes, the creation of performance management systems based on measurement and feedback for continuous improvement recognizes the importance of the voice of the staff. To gain further understanding of how to achieve the outcomes customers need, the ability to listen to the “voice of the process” is central.

Involving staff in process improvement research is one way to ensure that the library is listening to the voice of the process. Continuous process improvement is not a technique so much as it is a method for developing a change in attitude about how work is accomplished efficiently and effectively. It is an effective tool for developing staff commitment to producing results for customers. A process improvement study reveals a process’s shortcomings. The study steps lead to recognition of inefficiencies or prob-
lems with quality improvements that result from the way tasks are organized, staff is deployed, work is scheduled, or training is conducted. Bottle-necks, delays, errors, redundancies, non-value-added work, and unnecessary variation or unpredictability become evident. Often, using this methodology, problems are unearthed that, when remedied, actually contribute to exceeding customer expectations and/or reducing the costs associated with producing the desired results for customers.

"Before one can improve any system, one must listen to the voice of the system (the voice of the process). Then one must understand how the inputs affect the outputs of the system. Finally, one must be able to change the inputs (and possibly the system) in order to achieve the desired results. This will require sustained effort, constancy of purpose, and an environment where continual improvement is the operating philosophy" (Wheeler, 1993, p. 21).

The concept of continuous improvement is embedded in Total Quality Management (TQM). "If Total Quality Management has a distinctive strength, it is its capability of providing an integrative methodology for accomplishing 'more with less' through complex organizational action" (Harwick & Russell, 1993, p. 499). One of the basic tenets of TQM is that of focus on the customer, making its relevance to organizations faced with the "customers' victory" in the global economy very timely. "TQM as customer-leadership methodology should be understood as a strategy for the 1990s and beyond, involving long-term changes in institutional culture and institutional structure that begin and work through change in institutional process" (Harwick & Russell, 1993, p. 504, emphasis in original). Undertaking process improvement constitutes an action methodology that institutionalizes employee involvement and illuminates the relationship between what work is done and what results are produced for customers.

Continuous process improvement is also referred to as paying attention to the Gemba—a word used by the Japanese, derived from two Chinese words meaning "specific work" and "place." "Gemba is the assembly of critical resources and the flow of work that contribute to those efforts that directly add value to the customer" (Scholtes, 1998, p. 76). The Gemba is the "mission critical" processes and their supporting resources—staff expertise, staffing allocations, technology and partnerships with suppliers and customers—within an organization. The Gemba's measure of success is the delight of external customers and continued customer loyalty. The success of all other work in the organization (work in administrative, financial, and technical support functions) is how well it serves the Gemba. By conducting process improvement studies, the key relationships between organizational structures and systems, work process design and staff productivity, as evidenced by outputs and outcomes, is more fully understood. Listening to the voice of the process leads to a realization that work design, process simplification, and appropriate use
of innovative technology are absolutely key to meeting customers’ expectations.

**Overview of Process Improvement Activities**

A successful process improvement study depends, in large part, on:

- discovering customer expectations
- analyzing where and why the process falls short of those expectations
- creating and implementing solutions so the process will meet or exceed customer expectations

A first step in a successful study is discovering, through customer input, the quality standards or specifications that will meet customers’ needs; listening to the voice of the customer will provide the information needed to determine the standards or specifications that are satisfactory to customers. This discovery process can also generate ideas for what might delight the customers or exceed their expectations. For instance, customers may be concerned with accuracy of information received, reliability of service, or timeliness of access. They can be asked to estimate specific minimum and desired levels of each quality. They can describe how the service is used and what outcome they derive. This information can be useful in determining whether additional effort, resources, or enhanced technology that enable surpassing the present expectations will be welcomed or seen as non-value added.

“While specifications may be used to define when one is in trouble with regard to the voice of the customer, specifications do nothing to describe or define the *voice of the process*” (Wheeler, 1993, p. 23). Specifications derived from customer input do not indicate what is actually happening in the work process that may have contributed to after-the-fact feedback from an instrument such as LibQUAL+. If organizational focus is limited to whether or not customers perceive that quality standards or specifications have been met, a failure to detect the changes signaling that a process cannot be counted on to produce a consistent desired result or operate at its maximum capacity can occur. It is of little value to discover where services and products fail short of customer expectations if causes cannot be analyzed and increased quality cannot be provided to customers.

Libraries need to begin utilizing methods that analyze data from a process, over time, so the data can pinpoint problems. Where the quality is unacceptable or undesirable, root causes can be discovered and solutions sought that actually eliminate the problem. Current problem-solving methods that are not data-based, and that focus on isolated events, do not have the analytical power of the statistical process control methodology utilized in process improvement research.
Recognizing that variability is to be expected in work processes, statistical process control charts teach us to separate “potential signals from the probable noise. . . . Before one can use data to justify any action, one must be able to detect a potential signal within the data. Otherwise one is likely to be interpreting noise” (Wheeler, 1993, p. 31). Using this methodology allows us to predict the level of service quality by concentrating on the behavior of the underlying process and measuring whether the process is within normal variation or influenced by special causes affecting the process. It leads to taking action for improvement that is directly related to the discovered special cause and not associated with normal variation. Taking action that addresses normal variation will often lead to additional problems or no change in the desired outputs. Discovery of how work is organized and staffed, what resources are allocated, how training is conducted, and how work schedules are affecting the capability of the process, leads to an understanding of how the work design and human resource systems in an organization have led to limitations in service quality. Too often these limitations have been blamed on people as “personnel problems.” The human resource system is then engaged to appraise, judge, and punish, when what is actually needed is a process improvement study.

Listening to the voice of the Gemba processes, and filtering out traditional perceptions or mental models of how work should be organized and accomplished, can be very revealing. In fact, many processes in libraries today are unpredictable and the quality of the resultant product or service can vary either drastically or normally. Not meeting a quality standard where variation in the process is normal may be attributed to a lack of sufficient staff. If the variation shows that the process is out of control, a change in process or elimination of steps or previously unidentified special causes can bring the process back to normal without an increase in staff. When customers say they expect “reliability,” they may be communicating that they expect minimum variation in the services and products they receive. “The distinction between predictability and unpredictability is important because prediction is the essence of doing business. Predictability is a great asset for any process because it makes the manager’s job that much easier. When the process is unpredictable, the time series will be unpredictable, and this unpredictability will repeatedly undermine all of our best efforts. In fact, attempting to make plans using a time series which is unpredictable results in more frustration than success. Prediction requires knowledge, explanation does not” (Wheeler, 1993, p. 24) (see Control Chart in Step 5, below).

The control chart is the main tool that assures this predictability. It focuses data so that staff studying the process will ask the interesting and important questions: “What is happening, why, and what can be done to eliminate special causes that are affecting the quality of the output?” The voice of the customer can be used to define what is wanted from a process;
the voice of the process defines what you will get from a system (Wheeler, 1993, p. 79).

At the University of Arizona Library, process improvement teams have discovered ways to reduce the number of staff on a process while improving quality by:

- eliminating non-value-added steps
- redesigning the steps in a process
- introducing more efficient technologies
- improving staff training
- scheduling the appropriate level and number of workers to handle the peaks and valleys of work demands
- outsourcing to a more cost-efficient provider
- restructuring work teams to better utilize staff time

Several of these studies resulted in cost savings and all resulted in improvements to service quality. The library has been able to reallocate over $300,000 in salary monies to reclassify staff, improve salaries, fund new positions, and refresh technology. At least five professional positions from technical processing have been moved to front line direct services and to the Digital Library Initiative. These savings were realized even while order processing, cataloging, shelving, and interlibrary loan cycle time improved, often dramatically.

It has been the experience at the University of Arizona Library that the following steps in a process improvement study can lead to analysis of root causes and the application of solutions that can change the perceptions of customers about their satisfaction.\(^4\)

*The Steps Involved in a Process Improvement Study*

1. Gather information at the individual and small group level through focus groups, interviews, and short focused surveys on what expectations, experience, and concerns the customer has with the processes under study. Include in this assessment a picture of what would be ideal from the customers’ perspective as well as examples of events or episodes that led to their present evaluation of services or products. Sometimes customers cannot pinpoint a problem, but they can describe recent experiences as well as what it would look like if the process were getting the best possible outcome.

2. Determine what qualities of the product or service they value most; LibQUAL+ dimensions can be helpful here but there may be other desired qualities. These expectations should be tested with customers. For example, if timeliness is identified as an expected quality, determine what turn around time would be considered “acceptable” and what would be “desirable.”\(^5\)
3. Map the present workflow. Detail the steps associated with accomplishing the process. Many insights surface during the process mapping that point out possible problems. This step often reveals duplication of effort, lack of clarity as to who does what, differing methodologies utilized by each staff member for completing a step in the process, and the identification of “non-value-added” checking or approval of work that is 98% correct to begin with. This step often reveals that some staff do not know to whom their part of the work is handed off, and what is done after they finish their part. Not knowing what is required for the next steps to be efficient makes it difficult to ensure that those required steps are consistently taken. Or, as sometimes happens steps are eliminated in one part of the process to achieve an efficiency and the relationship to the following steps is not understood. The process of mapping allows the staff to hear the actual “voice of the process” at the step or task level (Lawton, 1993, pp. 108-11).§

4. Gather all available data from and about the process that is related to the qualities desired by the customer. This can include information related to, for instance,

- downtime of machines
- time it takes an item to completely go through the entire workflow
- number of “problems” referred to a supervisor
- an analysis of complaints
- volume of transactions/items processed per day/week/year
- charting of peak periods and slow periods

Gathering and charting these data will often demonstrate that staff perceptions of how a process works are sometimes inaccurate, especially as relates to the variability or predictability of the process. The inaccurate perception is not the fault of the staff. The way time is estimated often states an average time based on batching or aggregation of transactions. This gives no picture of the actual time it takes for each piece or full transaction to be accomplished. Costs related to staffing and staffing allocations are also significant data to identify if there is a goal to be cost-effective in producing the Gemba services.

5. Use tools to display the data in such a way as to make the patterns, trends, and interpretations grounded in reality. Using statistical process control charts can be very helpful in analyzing time series data and pointing to the actual occurrences of variation and limits of the current process (see Figure 1).

Figure 1 indicates that the time it takes to process a book for the hold shelf varies unpredictably: between 120 hours and 600 hours or between 5 days and 25 days. This picture can hardly be said to afford the customer a reliable service from the standpoint of wait time. Just informing customers of this actual wait time is not helpful. It would be
Figure 1. An Example of a Statistical Process Control Chart.
*UCL—upper control limit
**Avg—average
***LCL—lower control limit

misleading the customer to indicate that the average wait period is 360 hours or 15 days since, for eleven occurrences, the wait was less than that and for twelve occurrences it was more than that. If staff perceived less than fifteen days to be the “usual” time, they would be misinforming the customers. Utilizing control charts helps us see the process at this level of specificity and begin to understand the service quality from the customers’ viewpoint. Once the study eliminates as many causes as possible, the process is in control, and a predictable time period can be communicated to customers with assurance that the time goal can be met and is within their expectations.

6. Involve those who carry out the task in the analysis of the charts. This will often disclose that staff are aware of problems but feel unable to change the situation. The chart provides a mirror of the actual process. It provides them a view they do not often see but intuitively understand. They are used to thinking in terms of a perceived average time, and the chart lets them see that the Quality Standard set by customers is rarely met. Recognition that this is the current capability of the process leads to conversations about why this is happening and the root cause analysis phase begins.

7. Once all causes are identified, engage staff in designing new processes, suggesting the elimination of or changes in steps, and training for, and learning, new methods that are the most productive for accomplishing the steps with the customers’ desired level of quality or timeliness. Use deep brainstorming to discover how technology may help streamline these processes or how new processes can add value to the
service in line with customer expectations. Staff welcome the ability to streamline and improve but, previous to this research, no study methodology had been taught to them that allows them to do so in a way that maximizes the possibility of implementing the results. Staff are very used to applying temporary fixes, putting out fires, and not having the benefit of seeing how their set of processes adds up to the product or service they provide customers (The Customer is Always Dwight, 1989).

As staff begin the redesign process, they must be supported in understanding how what they do, what technology is chosen, and how the steps in the process are to be implemented, result in outputs that contribute to the desired level of quality contained in customer feedback.

8. Choose the optimal solutions, train staff, pilot test their implementation, evaluate the new results from the customers’ perspective, and take action to embed these changes in the work processes. Following the “Plan, Do, Check, Act” cycle, continue to listen to the voices of customers and the voice of the process, adjust and innovate. Aim at providing predictable, ever-improving, quality service that addresses changing demands and needs (Shewhart, 1939; Ishikawa, 1985).7

This brief description is offered to demonstrate how utilizing the process improvement approach can enhance and support the transformation of academic research libraries. Learning to value and utilize assessment techniques for the improvement of services is one necessary step in that transformation. Staff involved in these studies shift their attention from an internal daily task focus to an external customer focus. They also learn the value of data and analysis in understanding how their work contributes to outcomes for customers. They begin to make decisions “based on facts, research and analysis.” The skills and attitudes they develop then transfer to all parts of their work and begin to permeate the culture of the organization.

The result can make all the difference between an organizational culture that values inputs—“old measures”—and one that is focused on and values the quality and “match” of outputs to outcomes for customers’ “new measures.”

LISTENING TO THE VOICE OF THE ORGANIZATION: BECOMING ORGANIZATIONS FOCUSED ON CREATING THE DESIRED FUTURE AND MAXIMIZING THE CAPACITY TO ACHIEVE IT

Some staff think that, by utilizing new measures that are customer-focused, libraries will be driven to “just do what the customers say,” or be driven by “a business model focused on competition and the bottom line.” These are actual concerns raised when discussions of this topic occur at
ARL/OLMS workshops where the Systems Model for Organization Design has been presented. This model is based on the SIPOC (Supplier, Input, Process, Output, Customer) model developed by Deming and others and clearly depicts the customer as influencing the actual processes and the output of any organization. Producing outputs for the customer and organizing to create outcomes for customers is the focus of this model. The model also clearly depicts that the library's mission and vision should be leading forces that help shape the libraries' work design and choice of outputs and outcomes.

This model points to the importance of understanding the difference between being customer-focused in a Learning Organization context and being driven by the "unexamined" articulated needs of our customers and stakeholders. The model assumes a subtle but profound difference between responding to customer needs for the sole purpose of meeting a quality standard, and responding to customer needs for the purposes of organizational learning and the ability to continue serving customers in the future. The recognition of this difference is implicit in a sound definition of a learning organization: one that "is continually expanding its capacity to create its future" (Senge, 1990, p. 14). Developing the capacity to create the desired future, discovering how to tap staff's commitment and capacity to learn at all levels of the organization leads to the generative process of learning. "Learning in organizations means the continuous testing of experience, and the transformation of that experience into knowledge—accessible to the whole organization, and relevant to its core purpose" (Senge et al., 1994. p. 49). In a learning organization, the customer relationship is just one part of a complex system of meaningful relationships.

As libraries enter into the process of discovery and measurement, they "participate more deeply than we imagine in shaping the world that we perceive" (Senge et al., 1994, p. 27). The development and implementation of LibQUAL+ and other new measures places libraries as part of a larger system; a system that encourages the development of a shared common vision questions the organization's present views of reality and fosters learning, as individuals and as groups, and are the practices of a learning organization—shared vision, systems thinking, mental models, personal mastery, and team learning (Senge, 1990).

Research libraries have a shared vision. This vision is embedded in the Keystone Principles: information must be available free of marketing bias, commercial motives, and cost to the individual users; there is a responsibility for creating innovative systems for dissemination and preservation of existing and new knowledge; and that libraries are intellectual commons for the communities they serve, where people and ideas interact to expand learning and facilitate the creation of new knowledge. Listening to this vision should inform what is learned from customers. The
vision should also shape the analysis and solutions developed to create better services and products.

In this environment of ever-changing technological capability, economic uncertainty, social and demographic shifts, and emerging political interests, customer input must be viewed as one set, but not the only set, of important information that should affect strategic planning. The discipline of Systems Thinking must be explicitly practiced. Libraries do not exist independently of this environment. Trends and events external to research libraries are critical to their success. These realities and their effect on us must be understood if the vision embedded in the keystone principles is to be actualized. There are stakeholders other than the library’s direct customers surveyed in the LibQUAL+ instrument—governing boards, alumni, citizens, and future students, to name a few. It should also be recognized that implicit or explicit partnering relationships with our suppliers are key to this success. Libraries must work on those relationships to ensure that suppliers help maximize the outcomes for customers. SPARC (Scholarly Publishing & Academic Resources Coalition) is one such partnering relationship that ARL has initiated that demonstrates this systems thinking approach. In research libraries, there must be a clear view of how the parts, the units of work, relate to the actual provision of a service such as “Access to Collections.”

If listening to the organization is practiced in a learning mode, the ability to question current assumptions becomes a well-developed skill. Practicing the discipline of mental models—seeking data that allow questioning of deeply held assumptions that shape current views, biases, and internal perceptions—can keep libraries in touch with reality. Discovering through LibQUAL+ can help examine service quality from the customers’ perspective. Process improvement efforts can help question perceptions of how successful current processes are, and mapping those processes depicts the reality of their capability. It is important to attain this grasp of reality in order to learn how to change with and for customers.

The application of learning can be accelerated through the utilization of teamwork. The different skills and perspectives, from all parts of the organization, will lead to new ways of thinking and questioning. All staff need to be engaged in leading the organization. They bring untapped extensive knowledge, a variety of experiences and commitment to the vision and purpose. Charging teams with gathering data, assessing its meaning, and using it to change the way services are offered is practicing the discipline of team learning. Dialogues within teams, informed by the data they collected when measuring progress toward high performance quality standards, produce the synergy that is foundational to the development of new and innovative approaches. Without performance measures and a strategic framework for these dialogues, there is a risk of continued group-think and choices of strategies based on the beliefs of the most vocal or
those perceived as most influential. Learning and sharing learning, then, is a primary focus of teamwork.

Last, if staff are to be supported in moving, changing, and transforming their work environment to truly develop a culture of assessment, building compatible infrastructures that support the discipline of personal mastery will be necessary. Creating a supportive performance effectiveness measurement system can help each individual member of the staff assess her/his own personal current situation and develop goals that enable her/him to achieve personal visions. By encouraging the alignment of individual performance and learning goals with team quality standards, staff see the connection between self-development and serving customers. They are provided the opportunity to experiment, to contribute, to help shape and move toward, the shared vision. Developing such a system is less about setting and reaching goals than it is about setting goals and learning true capability. In designing systems that support personal mastery, there is an opportunity to understand how organizational policies or allocation of organizational resources actually contribute to the inability of staff to reach peak performance capability. By designing a system that calls for reflection, self-assessment, and peer support and advice, the learning organization contributes to the development of individual self-efficacy. A confident staff is a staff that willingly commits to continuous learning. A committed staff is one that can rise to the challenge of continuous change and appreciate the importance of the role played by the library in the accomplishment of the larger institutional goals of education, research, and service.

Sharing responsibility throughout the organization results in the sharing of information at all levels (Senge, 1994). "Silo-ing" of information and data should not be encouraged. This keeps staff in the dark about why change and transformation are necessary. Withholding power from those who have much experience and knowledge to contribute is not an effective strategy for future success. Staff should be included in planning, budgeting, and decision-making. Their views and perceptions should be included and their involvement in following up on what customers report on the LibQUAL+ instrument should be expected. They need to learn how to gather more granular information and use that information to drive improvement in processes and innovation in services. Listening to the whole organization becomes a springboard for change and transformation.

**CONCLUSION**

The creation of a new culture is a long journey. Many voices are needed to guide this journey and ensure arrival at the desired destination. To hear these voices, strong customer relationships must be forged. Staff involvement must be designed into our organizational structures.
Gemba processes need to be understood and improved. Organizational learning systems, including new measurement methodologies, dialogue, team synergy, and support for personal mastery, must be developed. As new measures are implemented, new approaches must be taken to make them significant. New bottles call for new wine. New measures are not compatible with the structure and culture of traditional internally focused organizations. The purposes behind experimenting with and learning new measurement techniques should not be put in the background but should be at the forefront of all discussions and dialogues.

Experimentation with new measures is for the purpose of discovering what needs to be done to achieve the shared vision of participating fully in the educational enterprise of the institutions of higher learning. The new measures chosen should ensure that there is access to scholarly and government information, that there are effective and easy ways of accessing this information, and that communities of scholars and learners interact in the pursuit and development of knowledge.

To do this, libraries must become cognizant of their current effectiveness. In the spirit of cooperation, libraries must develop benchmarking partnerships that lead to an increasing ability to continue to be effective as a group. Everyone in the profession, not just the leaders, must commit to make a difference and achieve the collective vision. Listening to the multiple voices of our customers, the staff, the Gemba processes, and the organization will be critical as new measures are developed. Each library must become a learning and listening organization. It must also become an acting organization—experimenting, seeking new perspectives and new methodologies, and designing new organizational systems that involve, engage, develop, and increase the commitment of staff and partner with customers to design the future they need that includes library values and vision.

NOTES

1 Hashin planning or hashin kanri is a system of planning that was widely used in Japan in the 1980s. The terms roughly translate into “target and means management.” Michael Brassard from GOAL/QPC called this system “Management by Planning.” It is very much a part of Total Quality Management and is a process for setting targets and orchestrating the future direction of the organization. Key concepts within hashin planning are: budgeting to a plan, continuous improvement, and annual breakthroughs. It includes a vertical as well as horizontal organizational focus—a team at the top sets directions and cross-functional teams implement annual projects that support breakthrough developments in a “critical few” strategic areas. It also includes wide involvement of staff in the form of input to the future vision, individual initiative and responsibility, a focus on discovering root causes, no ties to performance appraisal, a focus on quality and not profit, widely disseminated communication, and a focus on processes (see King, 1989). The University of Arizona adapted its planning process in the 1990s from Intel, which practiced Management by Planning, and defined it as: “A system through which management accomplishes its primary tasks.” Hashin planning:

• defines long-range organizational direction
• defines performance expectations based on customer requirements
• aligns resources to accomplish the "vital few" university objectives
• integrates employee activities functionally and cross-functionally to maximize impact for the University (it does not optimize one part of the university at the expense of others)
• monitors results to ensure focus and accountability on a continual basis
• utilizes data-based decision making for planning and implementation

—From the internal training manual "Management by Planning"

During 1997/98, a Strategic Project Implementation Team designed a framework for all teams to create Performance Measures and Quality Standards for their Mission Critical Processes (see Appendix for details). This framework then guided the development of individual staff performance and learning goals. Charles McClure, Information Use Management and Policy Institute, Florida State University (then at Syracuse University), was a co-consultant on this project and provided the terminology, the importance of aligning team and individual efforts with the strategic goals, and introduced the complexities of measurement. "Quick and clean" was a phrase McClure used over and over again to guide us away from the overwhelming challenges associated with formal data gathering. The other consultants on the project, MetaWest, Inc., from Tucson, provided guidance to keep the focus of the framework on continuous improvement for customers and helped develop ways of integrating the new frameworks into the teams via Team Leader Learning Networks.

"A Culture of Assessment is an organizational environment in which decisions are based on facts, research, and analysis, and where services are planned and delivered in ways that maximize positive outcomes and impacts for customers and stakeholders. A Culture of Assessment exists in organizations where staff care to know what results they produce and how those results relate to customers’ expectations." This definition of a "culture of assessment" applicable to libraries was originally developed by Amos Lakos (University of Waterloo) and Betsy Wilson (University of Washington) in 1998. It was revised and updated by Amos Lakos and Shelley Phipps (University of Arizona) for the ARL OLMS workshop given at the "Living the Future" Conference, Tucson, 2000. A copy is available from the ARL Office of Leadership and Management Services.

The University of Arizona did not utilize a formal Critical Incident Technique, but those who wish to can consult Stauas (1993) who offers a straightforward description of what is involved.

Two of these studies have been featured in the following articles:

Lawton’s book is an invaluable guide to conducting process studies. "Mapping the Process" (pp. 108-111) outlines the main purposes:
• Document the "as is" (current) process for analysis
• Identify process ownership
• Define the relationship among products and activities
• Identify bottlenecks, the critical path, and disconnects (places where things fall through cracks in the process)
• Determine the difference between cycle time and value-added time
• Establish a basis for measuring process performance
• Take action, then evaluate the results
• Measure process performance
• Prioritize improvement opportunities
• Take action

W. Edwards Deming and Joseph Juran worked with Walter Shewhart at Bell Labs in the 1940s. Deming first used this model with the Japanese in the 1950s. Deming changed it to the "Plan, Do, Study, Act Cycle" and recently Ishikawa added two additional steps. Many variations of this basic model exist in the "quality" literature.

“The Keystone Principles were developed by an informal group of librarians energized by the discussion held during a fall 1999 ARL/OCLC Strategic Issues Forum. The group agreed to write a statement articulating the traditional values of academic librar-

REFERENCES


Appendix

University of Arizona Library Performance Effectiveness System: Outline of definitions of the Team Strategic Framework and Goal Setting Processes

Current Situation/Future Analysis—each team assesses what it knows about its customers, its processes, its outcomes, its suppliers, the environment within which it is operating. This “assessment” is to be derived from data and information from customers as much as possible and informs the framework the team creates for its work for the year as a top priority.

Vision—each team is asked to envision what it would look like if it were totally successful with its customers. A “creative pull” vision is encouraged. Example B: The Fine/Arts Humanities Team will be recognized as a proactive, innovative, and vital force in an information-intense global environment by using our professional knowledge and expertise to meet the specialized fine arts and humanities information and learning needs of customers on campus and in the State of Arizona . . . . and provides learning experiences that inspire intellectual curiosity leading to information literacy, scholarship, and life-long learning.

Mission—each team is asked to define clearly what activities it will perform, what services and products it will provide for what customers, and what boundaries they lay claim to that differentiates their work from that of other teams.

Customers—each team is asked to list and understand the relationship to its primary, secondary, tertiary customers and to identify who its other stakeholders are.

Mission Critical Areas—these are the activities that are critical for the team to perform if its customers are to be served and its mission is to be achieved. In sum, these “MCAs” should define the mission of the team.

Performance Measures—these are the tools used to measure performance and evaluate progress. They are quantitative or qualitative indicators of the degree to which activities, services, and products are successful. Each team is asked to choose which are the most relevant measures they could use to assess success with customers and with stakeholders. Measures include:

Output/Extent; Outcome; and Quality (Efficiency, Cycle Time, Accuracy, etc.); Cost per unit; Cost per customer; Return on Investment; and Skills/Abilities and Applications of Learning.
**Quality Standards**—these are the specific, measurable, desired levels of performance or quality that customers would expect when receiving a service or product.

**Data Gathering Methodologies**—these are the intended methods for gathering data and information to know whether your quality standard is being met. Methods include measurement of the process (cycle time, accuracy, cost) and measurement of customers’ satisfaction or rating.

**Future Team Competencies**—this is a brainstormed list of the skills and abilities that the team will need in the future to meet and exceed customer expectations.

**Projects**—these are the most important organized actions that the team can take to meet Quality Standards. Completion of projects should improve the team’s capability of meeting the Quality Standard.

**Individual Performance Goals**—these are actions that individuals will take to achieve a result for customers related to the Quality Standard. They will be S*M*A*R*T goals: Specific, Measurable, Attainable, Results-Oriented, and Timely.

**Individual Learning Goals**—these are the actions that individuals will take to learn new skills related to their performance goals or to the team’s future work.
Example B: By October 1, I will have learned the curriculum goals of the 200 level courses in my discipline and learned what Internet products can support enhanced learning in these courses.

**Peer Developmental Reviews**—these take place at least three (3) times per year scheduled according to the milestone dates in the goal statement; at least three (3) peers, one from the home team and others chosen according to their ability to support and provide feedback, participate as a group; individual prepares a progress report and requests feedback re: successes and barriers; individual documents feedback and develops plan for Next Steps; Team Leaders keep a file of this summary and monitor for performance problems.
Perspectives on User Satisfaction Surveys

Rowena Cullen

Abstract
Academic libraries are facing two major threats: a global digital environment and increasing competition. They must improve the quality of their services in order to survive. The article explores the relationship between service quality and user satisfaction and examines how user surveys have been employed in a number of previously published data sets. A model which demonstrates how satisfaction can be seen as both a micro-level response to individual transactions and at the macro-level as an outcome of service quality is proposed. Using an evidence-based approach, gaps between user expectations and perceptions are explored as well as the gap between user expectations and managers' perceptions of these. Studies that include user surveys of electronic library services are also analyzed in terms of customer expectations. Suggestions are offered about ways in which library and information service providers could make more use of the information derived from their own and other organizations' user surveys to improve their services.

Introduction
Academic libraries are currently facing their greatest challenge since the explosion in tertiary education and academic publishing, which began after World War II. The global digital revolution is affecting both the traditional forms of the creation, organization, and dissemination of knowledge, and the world of tertiary education itself. The alliance of business and universities to create a new paradigm of tertiary education, and the

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emergence of the virtual university, supported by the virtual library, calls into question many of our basic assumptions about the role of the academic library and the security of its future. Retaining and growing their customer base and focusing more energy on meeting their customers' expectations is the only way for academic libraries to survive in this volatile competitive environment.

The service quality model is focused on meeting these expectations and retaining customers: “Quality service is a competitive necessity for businesses and service organisations,” state Altman and Hernon (1998). “Assessing service quality is the first step in retaining customers in today's competitive environment” (p. 53). When library customers are faced with a variety of alternative channels of information delivery, many of which are more convenient and can compete on cost, libraries need to re-examine the range and quality of services they provide and develop systems for consultation and cooperation with their customer and stakeholder groups. They need to ensure that their services both meet customer needs and customer expectations to the highest degree. That is, they need to compete both in terms of service quality and customer satisfaction. Even this may not guarantee survival. As Rowley (1996) asks: “What is the relationship between service quality, customer satisfaction, and purchasing or subsequent use of service?” (p. 416). What level of satisfaction is needed to ensure customer loyalty?

This is a question that has not yet been addressed by many libraries or by much research in the field of LIS. It raises many questions about the applications of service quality models and user satisfaction surveys in library and information services such as:

- what research has been done in the field of service quality and user satisfaction studies in the LIS literature?
- what has been learned from that research?
- how can research into service quality and satisfaction measures help libraries cope with an increasingly competitive environment and the new global digital environment by helping them retain customers?

This article seeks to address some of these issues by examining past research and data sets where they are available, and by attempting to draw some conclusions out of a simple meta-analysis of this research. The aim is to undertake a simple critical appraisal of the evidence and to ascertain if there are some systematic findings emerging from this research that will help us understand better the relationship between service quality, satisfaction, and customer loyalty in the unique industry in which we operate.

**Distinction between Service Quality and Satisfaction**

In a landmark monograph entitled *Service Quality in Academic Libraries*, Hernon and Altman (1996) use the SERVQUAL model to develop a
robust instrument for measuring service quality and satisfaction in academic libraries. In this volume they cite many of the works from the marketing/management literatures which have become seminal in the LIS literature on service quality. They find no LIS research on service quality to cite although they make good use of the existing performance management literature.

The SERVQUAL model used by Hernon and Altman and other researchers in examining service quality in the field of library and information services is derived from the work of Parasuraman, Zeithaml, and Berry (1988). In the SERVQUAL model, quality is defined as "perceived quality" rather than "objective quality," that is, it is dependent on the customer's perception of what they can expect from a service and what they believe they have received, rather than any "objective" standard as determined by a professional group or in conventional performance measurement. The model is best known for its definition of gaps between customer expectations and perceptions. Parasuraman et al. (1988) define five gaps from their research data:

Gap 1. The discrepancy between customers' expectations and management's perceptions of these expectations.
Gap 2. The discrepancy between management's perceptions of customers' expectations and service quality specifications.
Gap 3. The discrepancy between service quality specifications and actual service delivery.
Gap 4. The discrepancy between actual service delivery and what is communicated to customers about it.
Gap 5. The discrepancy between customer's expected service and perceived service delivered.

The first four gaps contribute to Gap 5—that is, the gap between customer expectations and customer perceptions of service received—and it is this last gap which has been the main focus of library research. There has been some interest as well in Gap 3, the discrepancy between service quality specifications and actual service delivery. In this article, some attention will also be paid to Gap 1, the discrepancy between customers' expectations and management's perceptions of these expectations, and the research literature will be examined for evidence regarding these gaps.

The mature SERVQUAL model, derived from iterative testing of the original model in a variety of contexts, identifies five dimensions of performance which customer expectations focus on: tangibles, reliability, responsiveness, assurance, and empathy. These are also explored by a number of researchers in the LIS field but are not the focus of this discussion.

In Service Quality in Academic Libraries, Hernon and Altman (1996) also explore the question of user satisfaction and the part this plays in
user perceptions of service quality. The relationship between service quality and customer satisfaction is a complex one. Service quality is variously defined as a component of customer satisfaction and vice versa. Hernon and Altman, for example, cite a definition of satisfaction derived from a number of marketing experts which Elliott (1995) gives as “the emotional reaction to a specific transaction or service encounter,” but they go on to indicate that “satisfaction may or may not be directly related to the performance of the library on a specific occasion.” As they explain, “a customer can receive an answer to a query but be unsatisfied because of an upsetting or angry encounter. Conversely, although the query might remain unanswered, another customer might feel satisfied because the encounter was pleasant, and the helper interested and polite” (Hernon & Altman, 1998, p. 8). However, as Hernon and Altman note, Elliott also observes that service quality is probably “an antecedent of customer satisfaction” (p. 36), and that “higher levels of service quality result in increased customer satisfaction” (p. 40).

A more complex model is later proposed, derived from Bitner and Hubbert, in which there are “two perspectives for viewing satisfaction that are relevant to library services. The first is service encounter satisfaction—customer satisfaction or dissatisfaction with a specific service encounter—and the second is overall service satisfaction—customer satisfaction or dissatisfaction with an organization based on multiple encounters or experiences” (Hernon & Altman, 1998, p. 182).

Satisfaction therefore may involve long-term, as well as short-term, perceptions, and a personal reaction to service built up over a number of transactions of varying quality. In addition, it would seem that, in the complex interchange of customer expectations and perceptions across the services delivered by an organization, customer satisfaction at the micro level concerning an individual service will contribute to the dimensions of service quality (tangibles, reliability, responsiveness, assurance, empathy) and that a global or macro view of quality of service derived from all the services with which the customer has interacted, and integrating the five dimensions of service quality, will contribute to their overall satisfaction with the organization.

Rachel Applegate (1993) has also explored this issue and uses the marketing and psychology literatures, and the concepts of material and emotional satisfaction, to identify the phenomenon of the “false positive” emotional satisfaction—a concept familiar to us in the truisms of library service that libraries generally achieve well in satisfaction ratings because “like motherhood and apple pie, they are considered to be a good thing.”

What is not clear is the interrelationship of material and emotional satisfaction with satisfaction at the micro and macro levels. To what extent do these concepts measure the same customer response and to what extent
are they measures of separate responses to service quality. A tentative relationship that might throw some light on the impact of satisfaction on customer loyalty is shown in Figure 2.

Applegate concludes that much more research is needed in the field of library and information science to determine the factors or attributes of service that contribute to user satisfaction at the macro and micro levels, and observes that simple user satisfaction questionnaires do not provide sufficient information for libraries to make changes in their practice or service delivery (Applegate, 1993, p. 535). This research is much needed
in order to define the level of user satisfaction that will keep libraries in business in the years ahead. But, like a number of other writers in this field, Applegate rightly observes that, over the years, a great deal of library and information science research has thrown light on these issues. From time to time it has been pointed out that the profession lacks the will or the ability to incorporate research findings into practice. Lack of incentives and the imprecise nature of the outcomes of providing information services have been suggested as reasons for this (Cullen, 1998). To this, Applegate adds lack of precision in overall satisfaction ratings. Comparisons have been made with the field of health sciences, where the evidence-based medicine movement, and the Cochrane Collaboration have led a major change in the application of new knowledge to existing practice. Librarians have played a major part in promoting the use of evidence in health information.

Why is it that the LIS profession finds it so hard to accept the findings of research carried out in its own institutions and is so slow to act upon it? Hernon and Altman may have identified a partial answer. Commenting on the difficulties that service organizations have in motivating themselves to focus on service quality, they cite Johnson:

Non-profit organizations that are focused on themselves rather than their customers display certain characteristics. They see their services as inherently desirable, blame customer ignorance or lack of motivation when their services are not used, relegate research about customers to a minor role . . . and assume that they have no generic competition. (Hernon & Alman, 1996, p. 9)

Many would agree that this attitude is prevalent in academic libraries although there is little research to support the assertion apart from the work of Edwards and Browne (1995). Such an attitude may even, paradoxically, be an outcome of the service ethic that takes many young professionals into the library/information professions. Most librarians certainly see their work as "inherently desirable." Whatever its cause, the reluctance of library managers to take their users' views into account will damage their institutions' abilities to compete and to survive in the current environment.

Perhaps librarians can apply the skills they have learned in the health information sector and use methods of critical appraisal to analyze the evidence available in the LIS literature. That is the approach taken in this article. While there is not generally a sufficient body of research using rigorous methodologies, reported in enough detail to make a full critical appraisal of evidence, there is a sufficient body of literature to draw some conclusions that might convince libraries and librarians into taking action. The focus is on service quality models and research into academic libraries except where there is relevant data in other studies.
THE ROLE OF SURVEYS IN LIBRARY EVALUATION

While surveys are now an accepted part of a library's evaluative processes and feature in most manuals of performance measurement, there is still some confusion in the literature about the role they play and how to interpret the results. The theoretical framework and conceptual approach to evaluation within which the survey will be applied is rarely addressed. The following examples show the value of such an approach.

For example, in the estimable IFLA guide *Measuring Quality: International Guidelines for Performance Measurement in Academic Libraries* (Poll & te Boekhoerst, 1995), valid, reliable, reproducible, and practical measures that will inform library decision making are applied to general library facilities, collection quality and use, the library catalog, availability and document delivery, and reference service. These are followed by suggestions for user satisfaction surveys focused on:

1. General user satisfaction which evaluates the service of the library as a whole.
2. User satisfaction with individual services or components of those services—e.g., opening hours or attributes of the librarian (for example, "a positive, friendly and courteous attitude" (Poll & te Boekhoerst, 1995, pp. 106-08).

The purpose of employing user surveys is described by the authors in the following terms:

- provides detailed information about the user's opinion of the service;
- helps to clarify the librarian's concept of the service as well as his/her assumptions about the users' needs;
- indicates problems; and
- suggests solutions (p. 30).

This model was adopted by the Council of Australian University Librarians, who carried out an investigation into some frameworks for a set of performance measures/indicators for use in Australian academic libraries. The first three indicators that were developed as self-contained packages and published in 1995 were: Library/Clientele Congruence (i.e., satisfaction) Indicator; Document Delivery Indicator; and Proportion of Sought Material at Time of Visit. These three formed part of six broad categories: General Library Use and Facilities, Collection Quality, Catalogue Quality, Availability of Items in the Collection (the last two indicators above were included here), Reference Service, and User Satisfaction (Byrne, 1997) and were derived primarily from the IFLA template with other inputs. Again, user satisfaction surveys are not integrated into an overall framework of evaluation. Measures of "perceived quality" (the congruence, or satisfaction, indicator) sit uneasily alongside measures of "objective quality."
A third example comes from a group of libraries which had already made serious attempts to use the professional literature to develop meaningful measures, including *A Planning Process for Public Libraries* (Palmour, 1980) and *Output Measures for Public Libraries* (Van House, 1987) both of which included user surveys as part of their methodology. In an attempt to develop more cost-effective and practical methods of capturing the views of users, and in order to benchmark some of the data between libraries, the New South Wales Public Libraries Evaluation Group (NSW PLEG) persuaded some of their colleagues to pilot a customer satisfaction survey in Sydney, Maitland, and Wollongong and some outer metropolitan and country areas in the state of New South Wales, Australia. The proposed instrument is designed to capture the user's response to the library visited without much granularity, and most of the detailed data requested is demographic (albeit useful for marketing and future survey design). Although the NSW PLEG group's survey instrument does not make explicit reference to a service quality model, the study does appear to be one of the first reported from library practitioners that attempts to capture information about which services were of most importance to users, along with satisfaction rates for those services. The results show up some discrepancies in what patrons believe is important, and what the library is apparently doing well, and the authors suggest that the surveys developed form a valuable management tool. They also note that, in a competitive environment, it may not be possible to benchmark results as they had hoped (Garlick, 1998).

Introducing their modification of the SERVQUAL model to academic library managers in *Service Quality in Academic Libraries*, Hernon and Altman (1996) focus on the need for library managers to integrate perception-based satisfaction and service quality measures into their library evaluation. Hernon and Altman use data collected from surveys and focus groups to refine the SERVQUAL model in order to develop a robust survey instrument for use specifically in library and information services. The resulting instrument is capable of gathering information from users at both the macro and the micro level and asks users about their overall perceptions of the library and the quality of its services, as well as their perceptions of specific services and the characteristics of specific services. There is a great deal of granularity built into the model in order that user responses to any aspect of service can be thoroughly examined. With this level of detail, user responses can contribute to a service quality analysis that both identifies measures of user satisfaction at the macro and micro level and provides information that supports a multivariate model of material and emotional satisfaction (Applegate, 1993, p. 533).

Two later research projects have tested the validity of the standard instrument used in the SERVQUAL model. Nitecki's (1996) doctoral research tested the SERVQUAL instrument on three aspects of library
service—interlibrary loan, reference, and closed reserve—and concluded that the instrument was useful in determining how well services match user expectations.

Hernon and Calvert (1996) tested the validity of the SERVQUAL instrument for evaluating academic libraries among library students and librarians, and came up with an instrument based on SERVQUAL but one that would offer libraries more choice about the customer expectations they might want to focus on and the priorities they might want to set in service delivery. It was also hoped that the findings from this study would identify a multi-method approach to measuring and understanding service quality from the perspectives of multiple constituencies—an aspect of library service not well handled in the original SERVQUAL model.

The culmination of much of Hernon’s work in this area was issued in 1998 in a manual published by the American Library Association in workbook format to encourage libraries to use the manual in this way (Hernon & Altman, 1998). Although it covers much of the material of Service Quality in Academic Libraries (Hernon & Altman, 1996), Assessing Service Quality introduces a range of methods for surveying users, including the SERVQUAL instrument used by Nitecki. In this volume the authors present a more complex model of the interrelationship among satisfaction, service quality, customer expectations, and service delivery in an overlapping set of spheres. This model, and the way in which libraries are encouraged to select pertinent areas of library service for examination by means of user surveys in the service quality instrument outlined, shows a much better integration of satisfaction in the paradigm of service quality.

**Analysis of the Data Emerging from SERVQUAL Studies**

*The Gap between Customer Expectations and Perceptions of Service Quality*

In her report in the *Journal of Academic Librarianship* on the first SERVQUAL analysis that she carried out, Nitecki’s focus is on the dimensions of service quality resulting from the data, which she concludes tend to a three-dimensional model rather than the five proposed by Zeithaml, Parasuraman, and Berry (1990), there being some overlap among reliability and responsiveness, and more obviously between responsiveness, assurance, and empathy. In the data provided in the article, there is evidence of significant gaps between user expectations and service delivery which are not commented on in detail. Negative scores range between −.178 and −1.888 (Nitecki, 1996, p. 186). Aggregate scores for gaps in service quality, as measured by the difference between the mean for indicators reflecting expectations compared with the mean of scores for perceived quality of service delivered are also predominantly negative and high, ranging from −.446 to −1.278. It is worth noting that the scores derived from Nitecki’s gap analysis do not correlate well with the overall
scores given for user satisfaction with the library's service at a macro level, which range from 6.596 to 8.058 suggesting that the macro satisfaction score measures something other than an aggregate of satisfaction with individual services.

Nitecki (1996) notes that the results seem to suggest that a higher overall rating of satisfaction correlates with users who “a) have not experienced a service problem within the past year; b) were satisfied with the resolution of problems experienced; c) indicated a willingness to recommend the library service they experienced to a friend, or d) suggested that the information they obtained from the service experience was more valuable to them than the information found among those users with opposite experiences” (p. 184). These observations tend to support the proposition that satisfaction at the macro level is more than an aggregate of satisfaction at the micro level over a range of services.

While Nitecki is concerned to point out that in this project she was not using SERVQUAL as a measure of performance but testing the validity and robustness of the instrument, it is still worth noting user responses to two key factors in the satisfaction ratings in reference service: “When a user has a problem, excellent libraries’ [or test library’s] reference services will show a sincere interest in solving it,” and “[e]mployees in excellent libraries [or test library’s] reference service will always be willing to help users,” both of which show major gaps between expectation and performance. As Nitecki observes, “reference service providers should concentrate on both showing sincere interest in solving user problems . . . . and staff willingness to help users” (Nitecki, 1996, p. 187). In the reference literature, this is a key factor in the provision of accurate reference service. In a significant empirically based study on the quality of reference service and reference librarians’ accuracy in responding to users’ queries, Gers and Seward (1985) note:

A second set of behaviours strongly associated with providing correct answers is showing interest in the users’ question. The librarian who shows the least interest in the user’s question is likely to provide a correct answer 33 percent of the time. The librarian who shows the most interest in the user’s question is likely to provide a correct answer 76 percent of the time. (pp. 53-54)

Dewdney and Ross (1994) also report that user satisfaction with the reference encounter is strongly correlated with similar behaviors, and that there is a strong correlation between friendliness and understanding of staff and the users’ overall satisfaction and willingness to return. It would seem that the existing research literature emphatically endorses the messages emerging from the service quality research literature in LIS and that libraries ignore these messages at their own peril. Furthermore, comparing service quality measures with other empirical measures enables us to draw some well-validated conclusions about the relationship between
"perceived quality" and "objective quality." Other examples later in this article explore this question further.

Some other research reports provide data which can be compared with Nitecki's. An online and paper-based survey of library service using a SERVQUAL model carried out at the University of Illinois at Urbana-Champaign provides data for a gap analysis based on the difference between the means for user expectations and perceptions of performance. Negative scores range between −.01 and −.92 (Schmidt & Searing, 1998, pp. 3-4). The averages of mean differences for service issues relating to staff activities are negative compared with a positive average score (service exceeds expectations) for indicators relating to collections, both print and electronic.

A SERVQUAL analysis of Interlibrary Loan services at Carnegie Mellon University also resulted in some negative scores, ranging between −.85 and −1.71 for indicators which, in the SERVQUAL model, are generally aligned with reliability of service—again largely on staff activities and attitudes (Stein, 1998, p. 211). The mean overall quality rating received was 7.545. Stein (1998) notes that the mean for users who reported that they had not experienced a problem with the libraries in the past year was 8.090, while among those who did experience problems and whose problem was resolved, the mean rating was 7.571, and those whose problem was not resolved rated the library at 5.650 (p. 214). It would be useful to compare these data with Nitecki's data on the same issue—overall satisfaction rates of users who had no problem, had a problem which was resolved, and had a problem which was not resolved.

In the most recent research report on the application of the SERVQUAL model to an academic library (in this case, Yale University's Library), Nitecki and Hernon (2000) report that, based on analysis of the data relating to the gap 5 case, "the library did not surpass reader expectations on any service attribute, but it did come close to meeting most expectations" (p. 263). Eleven areas where gap scores exceed −1.0 are noted. These include the ability to communicate with library staff through the Web page, document delivery through IL or other methods, easy use of the online catalog, photocopiers and computer printers in good working order, clear and helpful directional signs and information about library hours, and reshelving of materials. The three scores greater than −2.00 were for the following: online catalog as an accurate source of information about all materials held in the library, the ease in discovering in advance when the library is open, and materials being reshelved promptly. Nitecki and Hernon (2000) comment: "It is important to remember that the judgements about the importance of the attributes and the perceptions of services delivered are relative and are merely indicators of where priorities might be placed for improvement effort" (p. 263).
However, the quadrant analysis carried out by Hernon and Nitecki, which graphs expectations against performance, suggests a grimmer scenario; the attributes falling into quadrant 2 are those of most importance to users but are not perceived as services on which the library performs well. Twenty-six out of forty attributes fell in this quadrant. An overall customer satisfaction rating of 7.11 is compared with an adjusted mean of ratings derived from individual attributes of 7.32. The authors conclude that Yale libraries are meeting, but not exceeding, customer expectations. This can be compared with the mean scores in the Carnegie Mellon SERVQUAL analysis of IL of 7.545. It is also worth noting that the lower scores in the gap 5 analysis at Yale tend to be attributes associated with “reliability,” the indicator that emerges in most of these studies as the one rated by users as most important. This may suggest that there is more room for concern about the gap 5 scores falling below −1.00 and definitely about those falling below −2.00 than the authors indicate.

Researchers into SERVQUAL and similar models in LIS are divided as to whether the SERVQUAL instrument can be used as a diagnostic tool or for ranking library performance (Cook, 1999). While Nitecki’s comment about the lack of normative data with which to compare her results holds true for the LIS field, in some other disciplines there is a body of data emerging that throws some light on the scores achieved by libraries in some of these studies, in particular in Gap 5—i.e., the gap between customer expectations and perceptions of service. Such comparisons could add considerable meaning to both research results and to future applications of the model. For example, at Victoria University of Wellington, the SERVQUAL model has been used in a large number of MBA research projects in a wide range of industries. Geoff Durden, coordinator of the projects for many years, notes that, while there is no published cross-industry data available relating to SERVQUAL, from his own analysis of these projects over eight years, he is able to summarize findings of the gap between customer expectations and perceptions of service as follows:

A. Magnitude of Gap 5: 0 to −1
   Interpretation: relationship in good order with perhaps just one of the five dimensions exhibiting a significant gap between expectations and perceptions (usually assurance or empathy). Overall, perceived quality and satisfaction with the service is positive. These relationships need managing by a routine process of incremental improvement.

B. Magnitude of Gap 5: −1 to −2
   Interpretation: relationship is flawed along one, sometimes two, of the five dimensions. Gaps between expectations and perceptions along these dimensions are at a level that results in a slightly positive/neutral view about the overall quality of the relationship and satisfaction with the service. The relationship is in need of fairly urgent remedial action.
C. Magnitude of Gap 5: −2 to −3
Interpretation: relationship is badly flawed in two, probably three, of the 5 SERVQUAL dimensions (assurance, empathy, and probably responsiveness).
Overall perceived quality and satisfaction is negative. If client not captive, then relationship is in jeopardy. Urgent action is needed to try and recover the situation.

D. Magnitude of Gap 5: −3 to −4
Interpretation. The relationship is fatally flawed. Significant flaws in at least 4 of the SERVQUAL dimensions (the above plus reliability). Perceived quality and satisfaction is negative and greatly so. If client is not captive, then the relationship is in a terminal phase.
(Durden, personal communication, September 26, 2000)

Durden (personal communication, September 26, 2000) raises the question: “In the commercial environment where the client is not ‘captive,’ is it economically feasible to keep such a client?”

Scores for Gap 5 noted in the studies reported in this article come in the first and second categories noted by Durden. Several studies report scores between −1.00 to 2.00 and three in the Yale study in Category C. Durden’s warnings should be heeded: where a gap of −1 to −2 is noted, “the relationship is in need of fairly urgent remedial action.” Further, he suggests, where a gap of −2.0 to −3.00 is noted, “overall perceived quality and satisfaction is negative. If the client is not captive, then the relationship is in jeopardy. Urgent action is needed to try and recover the situation.”

It is perhaps the special characteristics of information service that lead to reliability being the dimension most at risk in these negative scores, although we should recall that research in the LIS field is indeterminate about whether the five dimensions of the SERVQUAL model are transferable without adjustment to the field, a point reiterated by Nitecki and Hernon (2000). We should also recall some of the initial premises of this discussion—that the customer is no longer captive and that some scores achieved in these studies suggest that customer loyalty and retention is at risk. Durden’s conclusions are stronger statements than are found in the LIS literature about the significance of SERVQUAL scores and suggest that attention should be paid to SERVQUAL results or related analysis, and that in other industries it is considered methodologically sound to take note of and plan remedial action based on Gap analysis scores.

Analysis of Data Emerging from Other Studies

The Gap between User Expectations and Managers’ Perceptions of Users’ Expectations in Public Libraries

The research reports and models, detailed earlier, focus primarily on the gap between user expectations and perceptions of service quality. In
the Zeithaml/Parasuraman model of SERVQUAL as described by Nitecki (1996), the first Gap is the discrepancy between the customers’ expectations and managements’ perceptions of these expectations, derived from “executive perspectives on a service organization’s design, marketing and delivery of service . . . the first four gaps are the major contributors to the service quality gap that customers may perceive” (p. 182). In the LIS field, there has been little overt attention paid to this aspect of service quality, but some studies outside the SERVQUAL framework nevertheless do contain data that might enable an analysis of any discrepancy between users’ expectations and management’s perceptions of these. One such data set is derived from a series of investigations carried out by Calvert and Cullen between 1992 and 1996. There is an assumption made in analyzing these data that, in stating their views on which aspects of service it is important to measure, librarians are reflecting their views of the expectations of users and are not vexatiously imposing their own beliefs about service quality in opposition to the views of their users. Data from both public and academic libraries are used here to illuminate this point.

The first study in the series explored the views of three separate constituencies: librarians, local body councillors (elected representatives who are members of the city council which has responsibility for the local amenities such as libraries), and users. Each group was asked how important they believed each of ninety-five aspects of library performance were. The ninety-five indicators covered a similar range of services to many service quality surveys. Although that study did not distinguish between librarians in management roles and para-professionals, it does provide some insights into potential discrepancies between user expectations and a professional/managerial view of these. Each aspect was rated on a scale of 1 to 5 by respondents according to its importance to them. For each constituency, the aspects were then ordered from most important to least, and the ranked list compared using Spearman’s rho test. There was .880 correlation between the ranked list of indicators favored by library users and that of the librarians (Cullen & Calvert, 1993). An earlier U.S. study using the same methodology had found a .57 correlation between library managers and users, and a .58 correlation between library service staff and users (see Table 1).

It is worth noting that, while there are discrepancies in these lists, it would not be true to state that the library staff did not care about users’ views—they have focused heavily on community needs in their responses and would appear to believe that they are “listening” to their communities. But they have a different view of these from the community itself. While small differences in scores among items in these ranked lists are not meaningful, larger variances in the rankings can be considered significant. For example, librarians rank users’ second favored indicator as being “Quality of books, magazines and other materials” at 16, their seventh
Table 1. Ranked lists of attributes: Public Libraries (Cullen & Calvert, 1993).

<table>
<thead>
<tr>
<th>Users' Rating</th>
<th>Librarians' Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helpfulness and courtesy of staff</td>
<td>Helpfulness and courtesy of staff</td>
</tr>
<tr>
<td>Quality of books, magazines, and other materials</td>
<td>Level of staff morale</td>
</tr>
<tr>
<td>Competence of management</td>
<td>Competence of management</td>
</tr>
<tr>
<td>Ease of use and arrangement of library catalog</td>
<td>Match of service to community needs</td>
</tr>
<tr>
<td>Accessibility of buildings (ramps for disabled etc.)</td>
<td>Match of stock to community needs</td>
</tr>
<tr>
<td>Expertise of reference staff</td>
<td>Extent of community awareness of library services</td>
</tr>
<tr>
<td>Total stock of books, magazines, and other materials</td>
<td>Accessibility of buildings (ramps for disabled etc.)</td>
</tr>
<tr>
<td>Level of staff morale</td>
<td>Range of services available whenever library open</td>
</tr>
<tr>
<td>Match of hours open with user needs</td>
<td>Ease of use and arrangement of library catalog</td>
</tr>
<tr>
<td>Total money spent on books and other materials</td>
<td>Quality of reference materials</td>
</tr>
</tbody>
</table>

* Expertise of reference staff was ranked at 11 (Cullen & Calvert, 1993)

favored indicator being “Total stock books, magazines and other materials” at number 37, their ninth indicator is “Match of hours open with user needs” at number 15, and their tenth favored indicator is “Total money spent on books and other materials” and is ranked at 19. These data match well with that reported by Garlick (1998), where users placed “Books for adults” and “Helpful staff” as their highest priorities by a significant margin (p. 69).

In the second study, the actual performance of these libraries was evaluated by library staff using the same indicators. Again, while the purpose of this study was not focused on service quality, the results tell us something about resource allocation and service delivery and the extent to which this matches the expectations of users. In other words, the results provide insights into the gap between managers’ perceptions of user expectations and those expectations themselves, although it is not constructed as a gap analysis survey.

In the top ten indicators, two of the users’ preferred indicators in the first study—that is their expectations—are listed as being well performed by the group of libraries surveyed. “Helpfulness, courtesy of staff” is listed second and “Expertise of reference staff” is listed ninth. “Quality of books, magazines and other materials,” “Total stock of books, magazines, and other materials,” and “Match of hours open with user needs” come in the next ten (i.e., the top twenty in terms of performance). Most
of the rest of the users’ preferred indicators are below fifty in the ranked list of ninety-five indicators (Calvert & Cullen, 1994).

Clearly, while some of the users’ priorities are being met, others are not. The professional argument has always been that users do not know what is good library service and cannot judge. The service quality model argues that this view should be re-examined and that libraries should start changing their priorities and align them more closely with those of users. These data support that view. It is interesting to note in passing that the question of “helpfulness of staff” and “willingness to help” remains a significant indicator in both service quality surveys and in some of these earlier studies and emerges as a critical factor in reference success. Both users and librarians seem to believe that this is an important aspect of service quality. And yet, in areas when libraries are made aware of users’ priorities in terms of service, they frequently find reasons for not altering resource allocations in order to deliver service at that level. Willingness to help users is thus treated as a micro level service quality issue rather than a macro level one.

**Academic Studies that Investigate the Gap in User Expectations and Managers’ Perceptions**

A second series of research projects carried out by Cullen and Calvert (1993) investigated the same issues in academic libraries. As in the previous studies, the perceptions of key groups of stakeholders (the governing body, senior library staff, library staff, academics, graduate students, and undergraduate students) were surveyed concerning the indicators which each group believed was important when judging the effectiveness of an academic library. The means of ratings given by all members of a constituency were compared, and a ranked list of indicators prepared for each constituency. Correlations between the rankings of the groups of interest here were:

<table>
<thead>
<tr>
<th></th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior library staff: academic staff</td>
<td>.69</td>
</tr>
<tr>
<td>Senior library staff: graduate students</td>
<td>.67</td>
</tr>
<tr>
<td>Senior library staff: undergraduate students</td>
<td>.67</td>
</tr>
<tr>
<td>Library staff: academic staff</td>
<td>.73</td>
</tr>
<tr>
<td>Library staff: graduate students</td>
<td>.72</td>
</tr>
<tr>
<td>Library staff: undergraduate students</td>
<td>.69</td>
</tr>
</tbody>
</table>

The tables of ranked indicators (see Tables 2 and 3) show some of the same orderings as in the Public Libraries study.

Despite the fact that, between the highest ranked indicator in each case and the tenth, the difference is never more than .514, and individual placings may not be statistically significant. The rankings, and the indicators placed in the top ten in each list, can be considered to reflect the expectations of users and management’s perceptions of these. (Compara-
Table 2. Ranked lists of attributes: Academic Libraries (Cullen and Calvert, 1993).

<table>
<thead>
<tr>
<th>Senior Library Staff Rating</th>
<th>Other Library Staff Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helpfulness and courtesy of staff</td>
<td>Helpfulness and courtesy of staff</td>
</tr>
<tr>
<td>Expert staff assistance to users when needed</td>
<td>Expert staff assistance to users when needed</td>
</tr>
<tr>
<td>Competence of management</td>
<td>Competence of management</td>
</tr>
<tr>
<td>Ease of use and arrangement of library catalog</td>
<td>Expertise of reference staff</td>
</tr>
<tr>
<td>Expertise of reference staff</td>
<td>Proportion of library materials listed on computer catalogs</td>
</tr>
<tr>
<td></td>
<td>Availability of reference staff when needed</td>
</tr>
<tr>
<td></td>
<td>Success in answering reference questions</td>
</tr>
<tr>
<td></td>
<td>Ease of use of public catalogs</td>
</tr>
<tr>
<td></td>
<td>Extent to which users are made aware of services available</td>
</tr>
<tr>
<td>Extent to which which users are made aware of services available</td>
<td>Proportion of items wanted by user finally obtained</td>
</tr>
<tr>
<td>Match of goals objectives to user group needs</td>
<td></td>
</tr>
<tr>
<td>Success in answering reference questions</td>
<td></td>
</tr>
<tr>
<td>Extent to which library achieves goals, objectives</td>
<td></td>
</tr>
</tbody>
</table>

sons between subject areas in the academic and student groups that were also investigated in the study showed far higher correlations than between the various constituencies.) Library staff again demonstrate their desire to be responsive to user needs and the indicator “match of goals and objectives with users” is very high on both library staff lists. But their aspirations and their perceptions of what users want are not close to reality. Staff, in fact, appear to be preferring indicators that reflect “objective quality,” that is, standard library performance measures.

SERVQUAL Studies of the Gap between User Expectations and Management’s Perceptions

These data can be compared with the findings of Edwards and Browne (1995) who address directly the problem of the gap between user expectations and management’s (or the professional’s) views of those expectations. In their study, Edwards and Browne developed a ninety-three item service quality questionnaire by canvassing the views of professional librarians and academics. This was sent to a randomly selected group of academics in four widely different Australian universities and a smaller group of senior librarians who were asked to respond to the questionnaire as they thought their users would.

In analyzing the results, Edwards and Browne conclude that the academics and librarians agreed on the significance of the five broad dimen-

<table>
<thead>
<tr>
<th>Academic Staff</th>
<th>Graduate Students</th>
<th>Undergraduate Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expert staff assistance to users when needed</td>
<td>Match of hours open with user needs</td>
<td>Provision of multiple copies of items in high use</td>
</tr>
<tr>
<td>Expertise of reference staff</td>
<td>Expert staff assistance to users when needed</td>
<td>Match of hours open with user needs</td>
</tr>
<tr>
<td>Proportion of library materials listed on computer catalogs</td>
<td>Provision of multiple copies of items in high use</td>
<td>Equipment (e.g., photocopiers) kept in service by good maintenance</td>
</tr>
<tr>
<td>Quietness of study environment</td>
<td>Proportion of library materials listed on computer catalogs</td>
<td>Quietness of study environment</td>
</tr>
<tr>
<td>Helpfulness and courtesy of staff</td>
<td>Quietness of study environment</td>
<td>Helpfulness and courtesy of staff</td>
</tr>
<tr>
<td>Total amount of library budget</td>
<td>Equipment (e.g., photocopiers) kept in service by good maintenance</td>
<td>Expert staff assistance to users when needed</td>
</tr>
<tr>
<td>Access to library catalogs via networks throughout the campus</td>
<td>Helpfulness and courtesy of staff</td>
<td>Number of seats per full-time student equivalent</td>
</tr>
<tr>
<td>Match of hours open with user needs</td>
<td>Expertise of reference staff</td>
<td>Provision of adequate number of photocopiers</td>
</tr>
<tr>
<td>Speed of provision of items through ILL</td>
<td>Proportion of items wanted by user finally obtained</td>
<td>Proportion of library materials listed on computer catalogs</td>
</tr>
<tr>
<td>Proportion of items wanted by user finally obtained</td>
<td>Speed of provision of items through ILL</td>
<td>Speed and accuracy of reshelving of materials</td>
</tr>
</tbody>
</table>

Sions of service quality (tangibles, responsiveness, reliability, assurance, and empathy) although the academics appeared to place greater weight on reliability and the librarians on assurance, the dimension which measures the extent to which service providers are knowledgeable, courteous, and engender trust and confidence. This finding ties in with Hermon and Altman’s observation that nonprofit organizations see their services as inherently desirable and do not focus on service quality and certainly not in terms of “perceived quality.”

Librarianship has high ideals, and these lead to perceptions that what libraries do has value. Perhaps it also leads to a somewhat paternalistic view that we know what patrons need and want and can be trusted to deliver it. This view may be interfering with a clear focus on customer satisfaction as a measure of service quality and may be preventing library managers from having confidence in users to decide their own needs and priorities.

Edwards and Browne suggest that library users focus on more specific elements of service quality. In their analysis of the two groups’ responses
to the questionnaire (that is, users and librarians who were asked to respond as they thought their users would), Edwards and Browne point to a high level of consonance in the results, but noted some key indicators on which academics placed a greater weight than librarians. When items for which the means of all responses for each group differed more than .5 are listed, some key issues can be identified. For example, some aspects of computer-generated service fall into this category, as do issues about access to library materials (journals arranged by title; direct user access to databases; lists of materials on subjects; dedicated terminals for staff) and some relating to some issues that are commonly perceived to be issues of service quality (staff will try another source if the item is not available; staff provide quick answers; large number of staff; reference shelves are tidy; staff can be relied on; staff locate missing items).

In their conclusions, Edwards and Browne (1995) highlight the similarities between the perceptions of academics and librarians:

The findings also show that the librarians in the sample had an accurate perception of their users’ expectations across the broad dimensions that research has found to be important in determining service quality. In addition, librarians were able to identify many of the attributes of service which the academics most strongly agree are expected of a quality information service. (p. 178)

The authors follow this statement by commenting again on the gaps in perceptions about individual indicators of quality:

In particular, librarians underestimated the level of expectation on items about computer based services, responsiveness in obtaining material, timeliness of service, and the arrangement of materials. They overestimated academics’ expectations for aspects of service involving user and librarian relationships, and for user education programs. (p. 178)

This is an important statement. The disparities in perceptions are of more significance than the congruities. One unhappy experience may be overlooked by a user but a series of incidents in which the user’s purpose on a specific day is frustrated will lead to low satisfaction scores on elements of individual services and lower satisfaction rates overall. Edward and Browne’s research deserves much attention and should be followed by many more such studies. But what are the lessons learned from current research?

The Digital Library

One of the key issues to emerge in the Edwards and Browne study is that, while librarians focused on information provision regardless of format (or believed that their users would perceive information in this way), users showed a greater than expected concern with format and with computer-based services. In the Cullen and Calvert study of academic libraries, there are only a few indicators that relate to electronic services, but
again these have a higher priority in the rankings of academic staff than library staff. Since most of the studies analyzed here took place, there has been a tremendous increase in the number and kinds of electronic services offered in libraries. From the tentative networking of online catalogs and CD-ROM indexes, electronic services now available include desktop links to a Web environment that offers users direct access to online database vendors, full-text articles available on demand, and instant access to electronic journals. As electronic access to a wide variety of publications becomes available to academic library users, libraries seek to cancel print subscriptions on the assumption that “just-in-time” document delivery and access to academic journals is more cost-effective than “just-in-case” print-based subscriptions with their accompanying costs of acquisition and storage.

Not many research studies of library effectiveness have caught up with this change. One of the few that has is the Western Kentucky University (WKU) Libraries Satisfaction Survey reported by Perkins and Yuan (2000) in which a survey placed on the WKU Libraries’ home page gathered usable responses from 247 participants. Participants were asked about their use and satisfaction with the libraries’ electronic resources, library center, use of library resources off-site, book and serial collections, and Internet databases. The data are not very clearly presented, the focus of the article being more about the way the survey was set up. Respondents overall seem to have been satisfied with access to databases both within and from outside the library and with the book and serial collections but less so with the libraries’ home page, with phone and e-mail assistance, and with access to CD-ROM products. (This article, which has the potential to add value to the literature, is an example of many which need editorial guidance in order to present findings in a meaningful way.) While some administrative changes were reported as taking place as a result of the survey, it did not seem to be integrated into any overall analysis of service quality of library effectiveness.

The SERVQUAL analysis carried out by the University of Illinois at Urbana-Champaign mentioned earlier also covered a full range of electronic services. Many of these are areas where the gap between expectation and perception of service is greatest. The online catalog has a poor satisfaction rating and does not appear to be meeting needs (user comments indicate dissatisfaction with the user interface), and there are mildly negative views of electronic full-text articles and Internet access. However, the largest gaps remain regarding basic service items (reshelving of materials and hours the library is open) with scores at nearly –1. The authors comment that these last two areas are where additional staff resources would be needed to resolve the problem. The quality of the collection, the general service skills of staff, and users’ knowledge of resources are also indicators with negative scores on Gap 5. They are therefore points where the quality of service offered needs addressing, “by a routine process
of incremental improvement” to use Durden’s words, even if they are not quite at the “in need of fairly urgent remedial attention” (Durden, personal communication with the author, September 26, 2000). These areas all turn up in user comments. As with many other studies, the authors talk about areas needing attention but, like many other commentators in the field, are too readily forgiving about shortcomings and too ready to accept that lack of resources prevent the institution from providing the service quality that users seek.

In the UIUC study, some electronic resources (e-mail reference services and the library Web pages) appear satisfactory to users. Overall electronic resources appear to be accepted as part of the library’s system of information delivery, and some are well regarded. However, the few service quality surveys that cover some of the issues relating to service quality in relation to electronic resources and services do not provide enough information about the service quality issues in this area. The few articles which attempt to analyze not only the technicalities, desirability, and costs of developing electronic library services, but also analyze some of the service aspects which will need to be monitored, and suggest some of the key issues, and even these fall far short of a comprehensive analysis. Issues identified in the literature so far include: the effectiveness of information storage and retrieval tools, menus and search engines, systems for structuring and cataloging digital resources alongside print resources, security and authentication issues, archiving of electronic material, user assistance, and instruction (Mandel, 1997). All of these will impact service quality as perceived by users of electronic resources as library clients. Sloan (1997) focuses on the continuing need for intermediation and assistance for users of electronic services, and describes several instances of libraries using video-based interactive reference services and e-mail reference services for this purpose. Such systems must be designed with user needs and satisfaction in mind if they are to add value to the quality of library services overall (Sloan, 1997). Harter (1997) also sees the need for electronic services to meet user needs by offering selected, cataloged, and classified high-quality information sources, supported by a professional intermediation and user assistance service, if digital libraries of the future are to offer the quality of service of the traditional research library. A futuristic study carried out by University of Maryland Libraries which attempts to identify the issues that the library needs to address in establishing the balance between traditional library sources and services and the electronic/digital library paradigm focuses on the development of electronic resources characterized by ease of use and richness of content. Integration of physical and electronic services and resources is seen as critical to quality of service and the ongoing mission of the University of Maryland itself.

Bertot and McClure propose a model where service quality in relation to networked electronic services is measured along with extensiveness,
efficiency, effectiveness, impact and usefulness, and adoption. These measures are applied to technical infrastructure, information content, information services, support, and management (Bertot, 1999, p. 4). Some interviews and focus groups are suggested as a way of gauging user responses to electronic services; however, the main focus is on transaction logging and network statistics.

Ease of use of access systems to electronic resources, ready assistance for users through electronic mediation and the quality of the resources themselves are emerging as key issues in the field of electronic resources (Klump, 1997). These issues need to be tested in the next iteration of the SERVQUAL model to ascertain their relevance to users’ perceptions of service quality in the academic library and ascertain the role of electronic services in user satisfaction at the macro and micro level. Such research also needs to examine which aspects of the electronic service contribute to the five variables (tangibles, reliability, responsiveness, assurance, and empathy) and how libraries can ensure that these criteria are met in the new electronic environment.

CONCLUSION

In their article in American Libraries where they suggest the profession should learn “what matters most to [library] customers” or suffer the consequences of losing their customers, Altman and Herron (1998) challenge libraries to ask themselves:

- Has the library defined its service reputation and customer loyalty and developed the means to determine the extent to which customers share the same vision?
- Does the library incorporate the results of that measurement into the planning process and revise its customer service plan as needed?
- Are a variety of measures used to construct a well-rounded picture of service quality and of completely satisfied and loyal customers?
- Does the entire library (all units and staff) embrace service quality and work toward the same ends?
- Is the library committed to stop spending staff and dollar resources on activities that customers do not care about and reallocate them to things customers prefer (p. 54)?

The research analyzed here tends to suggest that very few libraries could give a positive answer to any of these questions and do not understand the importance of service quality and customer satisfaction in retaining their customers in the context of the competitive global digital environment which threatens academic libraries today. Our examination of the research literature has shown that:

1. there is a body of research into service quality and the role of customer satisfaction in the field of library and information studies that
shows consistent results and patterns of responses by users in different places and types of libraries;

2. this literature indicates that there are significant gaps between users’ expectations and perceptions in some key areas of service, notably: quality of collections and access to these, the provision of a study environment, services and equipment that meets the needs of students, and willingness of staff to help users;

3. urgent remedial action is needed in some of these areas to increase user satisfaction at the micro and macro level;

4. there is also a gap between users’ expectations and our professional perceptions of these;

5. our past reliance on measures of “objective quality” have not always met customer needs;

6. there is a lack of resolve in the profession to address these two gaps that could lead to libraries not thriving as well as they might in a competitive environment.

The expectations of users are likely to change in the electronic environment, and these will impact at both the macro and micro level on service quality and overall satisfaction ratings. Overall satisfaction is likely to have a significant impact on the future of academic libraries and their competitiveness. Clearly, further research that would help integrate indicators evaluating electronic service delivery into the SERVQUAL model and other models of service quality and user satisfaction are urgently needed. Research that throws more light on the complex relationship between service quality and satisfaction at the macro and micro level is also much needed. But more than either of these, action is needed. Our research findings are clear, the gaps are clear, the significance of these gaps is becoming clearer, and action from the profession in reducing these gaps is overdue.

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Service Quality: A Concept Not Fully Explored

PETER HERNON AND DANUTA A. NITECKI

ABSTRACT

This article examines service quality and identifies issues meriting attention. The purpose is to guide the next generation of research on service quality in libraries and to ensure that the research has value to library planning and decision making. The difficulty of developing a process of data collection across institutions is also discussed.

INTRODUCTION

Over the years, those writing in the literature of library and information science (LIS) about quality have defined it differently. They have stressed the importance of developing and maintaining quality collections, have equated effectiveness (the extent to which goals and objectives are set and met) with quality, and looked at quality from the organizational perspective—that of the academic library or the parent college or university. As libraries embraced total quality management (TQM), other quality management styles (e.g., continuous quality improvement), and a culture of assessment, a number of them increased their commitment to support a customer orientation and to have customers who are satisfied with the service provided. It was only a matter of time before the concept of customer service, a concept independent of (and predating) TQM, was adopted and modified from the private sector. Customer service encourages retail and other organizations to meet or exceed those customers'

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expectations central to their mission, vision, goals, and objectives. In other words, the organization’s vision of its service role (and its inability to do everything for everyone well despite its best intentions) ultimately guides what services are provided and how they are offered. Service quality, in effect, draws on TQM and customer service as well as on marketing research. Fundamental to service quality is the belief that an organization exists to serve its customers, that is if it intends to survive and flourish in a highly competitive and ever-changing market. Service quality stresses that customers are worth listening to and that they are the best judges of the quality of the services they use.

The purpose of this article is to examine the concept of service quality in libraries—an environment that differs from the retail sector where service quality so often has been studied and the findings incorporated into practice. The article identifies some issues meriting attention, advances an understanding of the concept, and analyzes how to measure service quality. Furthermore, the article underscores that service quality and satisfaction are not synonymous concepts.

There are many reasons why libraries are interested in service quality. Some library parent institutions—universities, corporations, government agencies, and school boards—have made a commitment to be accountable to customers and compete for their loyalty. In such settings, libraries may have an externally imposed requirement to implement service quality principles. Some libraries, however, have recognized that the managerial approach that service quality implies is a way to improve their ability to meet their mission of serving users regardless of external pressures. Service providers deliver services to benefit their customers and perhaps to attract new ones. Improvement of service requires an understanding of the benefit, the customers, and the actions of the service provider, and then using that knowledge for planning purposes. The application of service quality concepts encourages service improvement.

There are many reasons why libraries should be interested in service quality. First, customers who share information about their expectations offer an opportunity for that library or other service provider to establish a closer personal contact with them. This relationship should result in libraries providing (and customers receiving) better service; after all, library staff are more knowledgeable about their expectations and how to translate that knowledge into services that delight customers and create loyalty. At the same time, customers are better informed about libraries and their service offerings and, it is hoped, gain a realistic set of expectations about what libraries can and cannot do. This mutually beneficial communication requires ongoing nurturing and continuous listening to customers. As problems are identified, they should provide feedback to the organization and be treated as opportunities for improvement and to raise the overall customer satisfaction with library services.
Second, external pressures from parent institutions call for accountability and the use of basic business practices by libraries. These are demands not traditionally associated with managing libraries in nonprofit organizations. As Irene B. Hoadley (1999) noted:

To say that a library is run like a business almost always carries a negative connotation in the academic world. This should not be the case because there are business principles that can benefit how libraries are run. . . . Better accounting and money management are benefits to libraries. Another is the accountability characteristic of business operations that requires self-examination to determine if what is being done is what really benefits the organization and those it serves. (p. 209)

Fundamental to service quality is the need for cyclic review of service goals and objectives in relation to customer expectations. By viewing service quality within the context of planning and implementing a service plan, libraries can identify areas for improvement that are central to their mission, goals, and objectives (Hernon & Whitman, 2001).

Third, attention to service quality, in brief, enables an organization to develop a partnership with its customers to gain a competitive edge. Present-day libraries compete with other service providers and may see a sharp decline in internal use statistics but may experience an equally dramatic increase in remote electronic use. Furthermore, technology and competitors help libraries shape the expectations of younger generations about information gathering, evaluation, and use. A library, like any service organization, must have a motivated staff committed to the provision of excellent service and empowered to work directly with customers to deliver such service on a continuous basis. The focus is no longer merely on collections and things that a library possesses; rather, the core activity of a library should center on service provision and improvement and on building an ongoing relationship between users and library services.

Assessment: A Multifaceted Concept

It is not possible to have one all-encompassing data-collection activity that answers any and all questions that might arise. Complicating matters, almost everything is assessable and measurable; measurement is a tool for the collection and analysis of data on which evaluators judge library performance against certain yardsticks (e.g., goals, objectives, performance and outcome measures, standards, and efficiencies). Simply stated, there are at least eleven questions about which assessment can be made: "how much," "how many," "how economical," "how prompt," "how accurate," "how responsive," "how well," "how valuable," "how reliable," "how courteous," and "how satisfied" (Hernon & Altman, 1998, pp. 51-55). Service quality addresses a number of these questions (pp. 58-59). Clearly,
individual libraries must decide for themselves how important service quality (and customer satisfaction) are in relation to their other data-collection activities. It may be that stakeholders (e.g., accrediting bodies) shape a library's approach to accountability and somewhat to planning. However, customers should be neither ignored nor slighted; their opinions are important and worthy of hearing.

**Service Quality Defined**

Service quality has been defined from at least four perspectives:

- **Excellence.** Although the mark of an uncompromising student and high achievement, the attributes of excellence may change dramatically and rapidly. Excellence is often externally defined.
- **Value.** It incorporates multiple attributes, but quality and value are different constructs—one the perception of meeting or exceeding expectations and the other stressing benefit to the recipient.
- **Conformance to specifications.** It facilitates precise measurement, but users of a service may not know or care about internal specifications.
- **Meeting and/or exceeding expectations.** This definition is all-encompassing and applies across service industries, but expectations change and may be shaped by experiences with other service providers.

Most marketing and LIS researchers have concentrated on the last perspective. The *Gaps Model of Service Quality* reflects that perspective and offers service organizations a framework to identify services in the form of the gaps that exceed (or fail to meet) customers' expectations. The model posits five gaps that reflect a discrepancy between:

- customers’ expectations and management’s perceptions of these expectations (Gap 1);
- management’s perceptions of customers’ expectations and service quality specifications (Gap 2);
- service quality specifications and actual service delivery (Gap 3);
- actual service delivery and what is communicated to customers about it (Gap 4); and
- customers’ expected services and perceived service delivered (Gap 5) (Zeithaml, Parasuraman, & Berry, 1990)

Although all five gaps may hinder an organization in providing high quality service, the fifth gap is the basis of a customer-oriented definition of service quality that examines the discrepancy between customers’ expectations for excellence and their perceptions of the actual service delivered. Expectations are *desired* wants—the extent to which customers believe a particular attribute is *essential* for an excellent service provider (Parasuraman, Berry, & Zeithaml, 1991), and perceptions are a judgment of service performance.
Jeffrey E. Disend (1991) correlates the Gaps Model with the concept of service quality. He maintains that poor service results if the gap, or difference, is large between what is expected and what is delivered. When what is delivered matches what is expected, customers find the service acceptable. If the service provided is better than what they expected, exceptional service materializes (p. 108). Consequently, when expectations and perceptions are ranked on a scale, the gap is a number reflecting the difference between the two—expectation ranking minus perception ranking. If there is a poor service gap, a minus number occurs. If the number, by chance, is zero, service is acceptable (expectations match perceptions). If a positive value emerges (perceptions exceed expectations), the service organization has achieved exceptional service. In reality, this characterization is too simplistic; even a minus number may signify exceptional service (see the section on Data Analysis, particularly coverage of quadrant analysis).

The definition of service quality presented in the Gaps Model recognizes that expectations are subjective and are neither static nor predictable (e.g., see Blanchard & Galloway, 1994). The model’s designers were influenced by the confirmation/disconfirmation theory, which involves a comparison between expectations and performance. Before using a service, a customer has certain expectations about it. These expectations become a basis against which to compare actual performance. After having some experience with a service, the customer can compare any expectations with actual performance and his or her perception is confirmed (if they match), negatively disconfirmed (if expectations exceed perceptions), or positively disconfirmed (if perceptions exceed expectations) (Oliver, 1976, 1980, 1997; Oliver & DeSarbo, 1998). Terry G. Vavra (1997), in his discussion of satisfaction, regards the term “positive disconfirmation” as “confusing” and prefers to use the words “affirmed,” “confirmed,” and “disconfirmed” to describe the three situations:

- expectations are confirmed when perceived performance meets them;
- expectations are affirmed (reinforced by positive disconfirmation) when perceived performance exceeds them; and
- expectations are disconfirmed (failed by negative disconfirmation) when perceived performance falls short of them (p. 42).

Clearly, his distinction also applies to service quality.

**Evaluation: Service Quality and Satisfaction**

In some instances, authors have equated or confused service quality with satisfaction (e.g., see Andaleeb & Simmonds, 1998; Comm & Mathaisel, 2000). A number of writers have also referred to service quality as an antecedent to satisfaction; satisfaction as the antecedent to service quality; or service quality and satisfaction as either interrelated or discrete.
concepts (Anderson & Fornell, 1994; Bolton & Drew, 1991; Cronin & Taylor, 1992; Taylor & Cronin, 1994; Woodside & Wilson, 1994). Clearly, “the relationship between customer satisfaction and service quality is an ongoing question in service marketing” (White & Abels, 1995, p. 37). Both service quality and satisfaction can be an end in themselves; each is worthy of examination as a framework for evaluating library services from a customer’s perspective. Service quality is an evaluation of specific attributes, and this judgment is cognitive. However, satisfaction focuses on a specific transaction or, in the case of overall satisfaction, it is a cumulative judgment based on collective encounters with a service provider over time. Satisfaction judgments are more affective and emotional reactions to an experience or collection of experiences: “Simply put, satisfaction is a sense of contentment that arises from an actual experience in relation to an expected experience” (Hernon & Whitman, 2001, p. 32).

Because service quality as a means of evaluation probes precise statements on which the library seeks customer input, it serves as a planning tool. Judgments about satisfaction, on the other hand, tend to be global in the type of questions asked. Unlike service quality, satisfaction focuses less on specific statements and relies more on open-ended questions. In satisfaction studies, there can be a probing of how customers rate the library in a few specific areas, though the list is much shorter and more general than found in a service quality questionnaire. The intention of satisfaction studies is to identify if some general areas require scrutiny, whereas service quality studies offer data to examine specific problem areas for improvement. Satisfaction surveys offer organizations the opportunity to gauge the temperature of customers on an array of services they use (or have used). If a service quality questionnaire, such as the one used at Yale University (Nitecki & Hernon, 2000), asks for “Any other expectations which you consider important?” and lets respondents insert whatever they want and to rate it on a seven- or ten-point scale (p. 271), then a study of service quality assumes a diagnostic function.

Measuring Service Quality

Service quality deals with the interaction between customers and service providers. Customer opinions about the service provided, whether on service quality or satisfaction, might be measured through a passive approach (e.g., comment cards available for customers to pick up and complete at their discretion) or an active approach (e.g., a formal survey or interview in which customers are asked to identify those expectations they want the library to meet or to render an opinion about their satisfaction with the service provided). The literature on measuring service quality has tended to focus on the former approach and, in particular, the use of SERVQUAL, a standardized instrument that has been used in various settings with only minor modification. It has been used in the consumer
retail environment, in banks, accounting firms, hotels, restaurants, real estate, the industrial market, hospitals, travel agencies, higher education, libraries, and other settings in the United States and other countries (e.g., see Nitecki, 1998; Parasuraman, Zeithaml, & Berry, 1994, p. 203; White & Abels, 1995, p. 38).

**SERVQUAL**

The fifth Gap—the difference between customers’ perceptions of what a service should deliver and how well that service meets idealized expectations—is the conceptual basis for SERVQUAL. Zeithaml, Parasuraman, and Berry (1990) designed SERVQUAL as a generic instrument that could be slightly modified for use in any particular service industry. It is the most popular method for the measurement of the fifth Gap.

One form of the SERVQUAL questionnaire is designed to be administered to customers of the service organization under review. It consists of twenty-two pairs of statements about factors that a service provider delivers. The first set of statements measures the customer’s expectations by asking each respondent to rate how essential each factor is for an excellent service to deliver. The second set of twenty-two statements formulates the same factors into descriptions about service delivered and ascertains the respondent’s perceptions of the level of service given by the institution or organization examined. For each pair of statements, the difference between the ranked perception minus the ranked expectation is calculated; the average of these Gap scores is the SERVQUAL overall quality score. Zeithaml et al. (1990) maintained that the set of twenty-two statements encompasses five interrelated dimensions that customers most value when they evaluate service quality in a service industry:

1. **tangibles** (the appearance of physical facilities, equipment, personnel, and communication material);
2. **reliability** (ability to perform the promised service dependably and accurately);
3. **responsiveness** (willingness to help customers and provide prompt service);
4. **assurance** (knowledge and courtesy of employees and their ability to inspire trust and confidence); and
5. **empathy** (the caring, individualized attention that a firm provides its customers) (p. 26).

Using factor analysis, they further contended that the twenty-two statements relate to (and define) these five dimensions.

As part of this basic version of SERVQUAL, respondents also rate the importance to achieving excellent service for each dimension by allocating 100 points among a set of descriptions of the five dimensions. These descriptions of the service quality dimensions and average point allocations
among respondents in different service settings enable researchers to make comparisons among studies and service industries.

A more recent version of SERVQUAL asks respondents to comment on a series of statements from three contexts (minimum service expectations, desired service expectations, and the perception of service performance) using a nine-point scale. Parasuraman, Zeithaml, and Berry (1994) regard the three-column format as preferable for its reconceptualization of expectations into desired and minimum expectations. Expectations, it has been argued, array on a continuum, with desired and minimum ones at either end; a zone of tolerance falls in between. That zone “represents the range of service performance a customer would consider satisfactory” (Parasuraman et al., 1994, p. 202; see also Boulding, Staelin, & Zeithaml, 1993).

Some researchers maintain that perception scores alone explain more of the variation in service quality than the gap measures, that “questions about service expectations may be based on memory or biased by actual services received,” or that the difference between expectations and service perceptions may not measure quality (see Andaleeb & Simmonds, 1998; Babakus & Boller, 1992; Cronin & Taylor, 1992, 1994; Teas, 1993). Yet other investigators (Caruana, Ewing, & Ramaseshan, 2000) have shown that expectations scores have a direct effect on perception scores. Critics have questioned whether respondents can distinguish between desired and minimum expectations and about whether customers have formulated specific expectations about services (Caruana et al., 2000, p. 8).

With the three-column format, respondents provide a perception score for the same statements for which they have just identified their minimum and desired expectations. As Caruana et al. (2000) note: “Although it is possible for respondents to provide perception scores that are below minimum expectations, it is likely that the prior scores allocated to expectations will anchor the either-end points in the desired-minimum expectations continuum determining the scale point width with which perception scores will be obtained” (p. 3). They found that “respondents find it difficult to visualize [a] real difference between desired and minimum expectations, and the results obtained [from their experimental study] seem only to indicate the allocation of relatively lower scores to minimum expectations when this is asked in conjunction with desired expectations” (p. 8). They further question “the diagnostic usefulness resulting from the simultaneous collection of expectations and perceptions scores. It would appear that [the] collection of data about expectations and perceptions is best done separately. The former can be conducted on a less frequent basis than the latter” (p. 8). “Asking [about] desired expectations in conjunction with minimum expectations and perceptions . . . appears to result in higher desired expectation scores than when these are asked separately . . .” (p. 8). The “addition of minimum expectations ap-
pear to have added little that is of incremental value to the measurement of service quality" (Johns, Lee-Ross, & Tyas, 2000, p. 15). However, when both expectation and perception ratings are sought together; the data provide an opportunity to evaluate the relative difference between the two at the level of the twenty-two service statements (used in the basic version of SERVQUAL); when the data are collected separately, evaluation can occur only with the average rating of perceptions and expectations but not between their gap relationship.

There is disagreement over which version of SERVQUAL to use, and the instrument can only be slightly modified without having an impact on the dimensions that are probed. Although researchers often make comparisons across service industries, “the nature of services may be such that it is impossible to ask the same series of questions meaningful to customers in two different service industries” (e.g., see Babakus & Boller, 1992; Bolton & Drew, 1991; Carman, 1990; Cronin & Taylor, 1992; Dabhokar, Thorpe, & Rentz, 1996; Lapierre, Filiatrault, & Chebat, 1999; Teas, 1998). A number of authors concur that service dimensions are service industry specific: the number of dimensions and their stability across various service industries are likely to vary (e.g., see Babakus & Boller, 1992; Carman, 1990; Van Dyke, Kapelman, & Prybutok, 1997). Parasuraman et al. (1994) have moved from five to three dimensions: reliability, tangibles and, as a single dimension, responsiveness, assurance, and empathy (p. 211). Some other studies support the consolidation and regrouping of dimensions (Dabhokar, Thorpe, & Rentz, 1996).

Significantly modifying the scale and dimensions decreases the utility of SERVQUAL for cross-industry comparisons. Nonetheless, as discussed in this article, there are some important differences in LIS, such as with the information-gathering behavior of various groups, and therefore the set of dimensions selected must better represent LIS.

**SERVPERF**

SERVQUAL is not the only generic instrument that has been used to gauge service quality. For example, SERVPERF, a modification of SERVQUAL, was developed in 1992 and measures service quality based solely on performance. It looks at the same twenty-two statements—worded the same as SERVQUAL—but it does not repeat the set of statements as expectation items. However, SERVPERF has apparently been rarely used in libraries; researchers have shown a clear preference for SERVQUAL, which has broad application to service industries.

**Planning versus Comparative Normative Measures**

The original intent of SERVQUAL was to provide a scale that a company could use to understand better "the service expectations and perceptions of . . . [its] customers, [to] assess its overall quality of service as
perceived by customers . . . [and to] identify the key dimensions, and facets within those dimensions, on which it should focus its quality-improvement efforts” (Zeithaml et al., 1990, pp. 175, 177). In addition to offering an instrument that had value for local planning, SERVQUAL's designers also suggested that other applications of the instrument were possible. Among these were comparing the service quality of several competing companies through tracking SERVQUAL perception scores along individual dimensions or overall service quality and providing insights about a company's relative strengths and weaknesses (Zeithaml et al., 1990, p. 178). The quantifiable measures of service quality that SERVQUAL offers intuitively appear attractive for drawing generalities about library services and for comparing service quality among different libraries.

To use SERVQUAL scores to track changes in service quality within a library assumes that the monitored service (or services) provided has, at least, a consistent purpose, if not a commonly defined population served, and perhaps even adheres to a set of service standards. However, to use the instrument to compare service quality across different organizations implies that common service goals or norms exist against which customer perceptions are tracked. In some service industries, profit or customer retention define the common norm. In others, professional service standards, such as accreditation standards in health care (e.g., safe and efficient patient care, improved health outcomes, and patient satisfaction), are established. Such commonly held norms are absent among research libraries. What one library aims to deliver by offering reference or document delivery services, for example, may differ from what another library defines the service to be. Among such differences, what does a comparison of customer perceptions of services delivered and expectations from different libraries tell librarians?

Service quality gap measures might mistakenly be confused with evaluation of the effectiveness of the library's communication about its services and the customer's awareness of such offerings. Comparisons of expectations among users of different libraries might produce trends that suggest commonly held values about research library services. Whether research libraries can formulate commonly-held norms for service has not been determined.

TEXAS A&M Study Seeks Normative Measures

Seeking best practices that foster customer satisfaction and perceptions of high service quality motivate the development of commonly accepted service norms. The SERVQUAL instrument and structure might be used to help identify candidate institutions for such an analysis, leading to the formation of those norms. This has been one of the objectives of a pilot study initiated, in 1999, among twelve Association of Research Libraries (ARL) libraries led by Fred Heath, Colleen Cook, and Bruce Thompson.
of Texas A&M University. The Texas study designed a “uniform” SERVQUAL and tested its application as the instrument shifted from having “strategic [decision making] and diagnostic utility at the local level” to “a mechanism for setting normative measures” applicable across institutions (Cook & Heath, 2000, p. 1). As explained by the research team, the purpose was to predict key elements of service quality across institutions. If the instrument has “utility as a best practices tool for research libraries” (p. 2), it will be available for their use, presumably on an as needed cost-recovery basis. Their study instrument represents an effort to modify SERVQUAL to meet the needs of research libraries, presumably over time, and not to make comparisons across service industries.

The 1999 version of the Texas study instrument (introduced as LibQUAL+) presents forty-one statements accompanied by the previously described three-column rating format: minimum service expectations, desired service expectations, and the perception of service performance of the library reviewed. Heath, Cook, and Thompson assert that these statements examine three dimensions (affect of service, reliability or service efficiency, and tangibles) and introduce a fourth dimension (resources), thereby, they claim, better reflecting the service quality dimensions of research libraries than the original SERVQUAL set of factors and dimensions developed across service industries. A critical set of questions relates to how these modified SERVQUAL statements and questions were produced and whether they reflect the new cluster of dimensions applicable to the service setting in research libraries.

As the development process for LibQUAL+ continues, that process merits scrutiny for whether or not it devotes sufficient attention to reliability and validity issues. For example, in conducting our own limited pretest of the 1999 instrument, unfortunately, we discovered some shortcomings (e.g., some questions relied too much on library jargon, were open to different interpretations, and failed to address adequately the full range of the library’s service role). Like some other researchers, we found that those pretested tended to be confused by the three-column format and would grow tired of moving the scroll bar from one column to another. They might simply insert a number that reflected neither their true expectations nor perceptions. Some of the pretest subjects felt that the first two columns influenced their perceptions and, consequently, they questioned the significance of the gap that emerged.

The study plan included preliminary site visits through which library customers and staff were to be interviewed by the designers to develop a set of items that users perceive as critical in the delivery of excellent service quality in research libraries. However, an assessment of the applicability of these newly proposed forty-one statements as normative measures of service quality for research libraries will require a better understanding of the answers to questions such as:
• Who decided what to ask?
• How much did customers and library staff at each site participate in the process of selecting those statements and questions and the order in which questions were asked?
• How important is each statement and question to each institution and its staff, customers, and mission?
• Why would these same statements, questions, and descriptive variables be of value to customers at all other research institutions?
• How well do the dimensions probed reflect the provision and receipt of library services from the perspective of the users of these services?

This article is not the place for a detailed assessment of the findings of the pilot study. Rather, our intention is to focus on the instrument and the data-collection process as a possible mechanism to compare service quality among research libraries. We are eager to learn from the pilot and particularly to explore its premise that the LibQUAL+’s three-column framework of capturing customer opinions about expectations and perceptions of services delivered in different libraries will result in a set of comparative assessment factors to use across library settings. However, for purposes of identifying “best practices” through normative comparisons, more than statistical relationships among LibQUAL+ scores will be needed.

Harry and His Colleagues Seek Planning Tools

Believing that SERVQUAL does not sufficiently address local expectations and priorities, Peter Hernon and his colleagues in the United States and New Zealand developed a generic set of expectations that individual libraries could use as a guide for deciding on those statements that they might treat as priorities (Calvert & Hernon, 1997; Hernon & Altman, 1996, 1998; Hernon & Calvert, 1996). Central to their approach is the belief that whatever expectations are probed should result from local review and the input of library staff and some customers. Their research has focused on one library or service location and has not attempted to determine the relevancy of the statements across institutions or over time.

Recently, Nitecki and Hernon (2000) combined the local approach to identify service factors with the earlier version of the SERVQUAL questionnaire framework, trying to produce an instrument useful for local planning and diagnostic purposes. Their study took place at Yale University libraries, and the success of the project suggests that it be replicated at other institutions. Central to this approach is that the statements require modification from setting to setting, as determined by the priorities for service improvement established by service providers and managers.

Conceptual Issues to Address

It may be that some librarians will call for continuation of the Texas A&M approach to finalize a set of statements, questions, and dimensions
applicable across institutions, while simultaneously pursuing the approach proposed by Nitecki and Hernon. Before proceeding, a number of conceptual issues merit consideration. We encourage a national dialogue over these issues as well as the same type of research that is presently underway in marketing—research looking into service quality, satisfaction, value, worth, and how they fit together into a model of service provision and improvement.

Can Service Quality Be Predicted?

In their literature review, Andaleeb and Simmonds (1998) note that some authors “have suggested that service quality can be predicted adequately by using perceptions alone” (p. 157). The idea of prediction assumes that service quality deals with behavioral intentions—a topic that some researchers are only now investigating (Cronin, Brady, & Hult, 2000). There is disagreement about whether service quality should be measured as attitudes, perceptions, or disconfirmation. Furthermore, expectations are likely to change over time and from institution to institution, and expectations involve subjectivity.

Those challenging the disconfirmation theory and the Gaps Model have argued that “scales ‘performance’ data alone is a more robust measure of service quality than the ‘performance-expectations’ construct predicted by disconfirmation theory” (Johns, Lee-Ross, & Tyas, 2000, p. 25). Johns, Lee-Ross, and Tyas (2000), for instance, suggest that “subtracting customers’ expectations from their perceptions destroys much of the discriminating quality of SERVQUAL data and produces a great deal of statistical ‘background noise’” (p. 25). Nitecki (1995) used discriminant analysis to try to determine which SERVQUAL factors best characterized differences among users of three different library services (interlibrary loan, reference, and reserve services) in a research library (pp. 154-61). She concluded that “the SERVQUAL dimensions as calculated from the averaged difference of perceptions and expectations rankings according to the factor groupings described by the scale’s designers are not good discriminating factors to differentiate the three library services groups” (p. 161). Furthermore, perception discriminating variables are more important than expectation variables in predicting customers by service. Because trying to use SERVQUAL data for predicting service differences has never been examined within a library setting, such an application merits considerable scrutiny and cautious interpretation of the findings as well as an extensive examination of issues related to reliability and validity.

The Gaps Model and SERVQUAL

The Texas A&M project applies data collection to the entire campus population, not all of whom are library customers. It seems appropriate that there be a review of the value of gathering insights into service quality for non-customers, some of whom would never use a library, and that
ways be developed to represent excellence more as a core component of service quality. That review should also examine all five gaps and determine whether or not service quality should be more inclusive of the five gaps (Gaps Model). Input from non-customers may contribute to an understanding of other gaps, but it has no relevance to Gap 5—the defining gap for service quality.

Is it sufficient to focus on the perception portion of SERVQUAL or LibQUAL+ and to de-emphasize expectations, either "ideal" expectations (the earlier form of SERVQUAL) or minimum and desired expectations? Do we need to develop "an attitudinal approach that is operationalized within the perceptions side of SERVQUAL...?" (Caruana et al., 2000, p. 9). Caruana et al. (2000) concluded that "it may be that customers' expectations about services are often passive and ill defined. Therefore, direct measures may elicit expectations that otherwise might not operate in customers' cognitive evaluations" (p. 8).

Dimensions

Nitecki (1998) noted that SERVQUAL "respondents were asked to confirm whether or not the twenty-two statements and the five described dimensions adequately reflected the expectations for excellent library service quality and whether any were judged 'not at all essential'" (p. 185). Her conclusion was that "the clear majority of respondents... confirm that there are no other expectations or service factors beyond what are cited on the questionnaire which are important to their evaluation of library service quality" (p. 185). Based on the findings of the Yale study, we speculate that her observation may have reflected the passive nature of library users on the question of expectations rather than a measure of the truth about the list's comprehensiveness at any one time. Similar to the research on various service industries in the profit sector, investigators using SERVQUAL in libraries have tended to find "reliability" as the most important dimension and "tangibles" as the least important one. Susan Edwards and Mairéad Browne (1995) suggest that the five dimensions "may not hold for information services in a university library" (p. 179). Dimensions, they maintain, should address "technological features of service":

There is also evidence that some items which cluster around communication are rated relatively highly by academics and stand out from the other components (e.g., competence) as an aspect of the assurance dimension. User education, which is included in "communication," may also form a separate dimension. (p. 179)

Cook and Thompson (2000c, p. 256) found that three dimensions applied to their institution: tangibles, reliability or service efficiency, and affect of library service, which comprises the more subjective aspects of service, such as responsiveness, assurance, and empathy. Cook and
Thompson (2000a, b) also called for more research on the dimensions applicable to libraries. Nitecki and Hernon (2000) concur and found that there might be other dimensions for library service, such as the customer preference for self-sufficiency or self-reliance. However, given their change of SERVQUAL from a generic form to one that is institution specific, it is not surprising that another dimension surfaced.

In a subsequent study, Cook and Health, in this issue of Library Trends, suggest that service quality may encompass the following dimensions:

- affect of service (empathy, responsiveness, and assurance)
- ubiquity and ease of access (formats, timely access to resources, and physical location);
- self-reliance;
- reliability;
- comprehensive collections; and
- library as place (utilitarian space and symbol of the intellect).

These six dimensions may well serve as a foundation on which additional research can build. The work of Hernon and his colleagues consistently reflects the importance of self-sufficiency or self-reliance, a dimension not likely to occur in retail settings except perhaps in e-commerce. It seems evident that library researchers are not focusing on dimensions that enable a comparison across service industries. Rather, they are focusing on dimensions that explain service quality within libraries. In conclusion, managers should be cautious in their use of any set of dimensions as reflecting service quality in libraries at this time.

Study Purpose

As Vavra (1997) notes, “the very act of surveying customers conveys a very positive message; the organization is interested in its customers’ well-being, needs, pleasures, and displeasures. While this is admittedly a ‘marketing message,’ there is nothing wrong . . . in allowing a survey to serve both . . . informational and communication roles” (p. 28). He defines the informational role as collecting information from customers about what “needs to be changed (in a product, service, or delivery system) or . . . how well an organization is currently delivering on its understanding of these needs” (p. 28). Communication focuses on messages and the image that the organization wants to portray.

Vavra comments that response rates for surveys of service quality and satisfaction “are declining” because they are often conducted with “a research mentality” and do not adequately address the informational role or re-engage customers in providing ongoing feedback to the organization about its services. The tendency is to downplay “the importance of reinforcing the customer’s participation” (p. 83). Clearly, customers must see that their input directly affects services and their delivery or, as Vavra
explains, "the research mentality must be replaced with a customer-relationship mentality. In such a perspective, reinforcing the customer's participation is essential" (p. 84).

If Vavra is correct, more studies must use the data collected to improve their services over time, thus showing respondents that their views and comments were heard. The communication aspect must be stressed more and linked to an informational role, while the research mentality must give way to the planning needs of an organization.

**Method of Survey Delivery**

The basic approach has centered on use of a printed and mailed questionnaire, but Heron and Altman (1998), as well as others, employed an in-house survey. Response rates for studies using SERVQUAL have ranged from 27 percent to 76 percent, with the majority of mailed surveys producing over a 50 percent return rate (Nitecki, 1998, p. 185). In their adaptation, Nitecki and Heron (2000) had a response rate of 45.2 percent but determined that there was no significant difference between those who responded and those who did not.

Marketing research using SERVQUAL often accepts response rates around 20 percent. However, LIS has typically sought much higher response rates. The Texas A&M research team planned to deliver the multi-institutional survey via the Web with e-mail notification and were willing to accept a response rate of 20 to 30 percent. Such a response rate risks a self-selected sample in which responses are not representative of the survey population. Furthermore, Vavra (1997) observes a tendency among people who communicate electronically, via e-mail, to provide less thought out, less reasoned, and quick responses (pp. 207-08). Research into service quality must return to Vavra's view of communication and explore ways to get respondents to accept the imposition and share their opinions truthfully.

If low expectations for a response rate are set, and if respondents do not represent a population, the implications of these issues should be discussed and debated widely in the LIS literature. Thompson (2000) argues that response rates of less than 40 or 50 percent are common; however, this is not true of library and information science, where a number of studies have produced higher rates of response (p. 4). Clearly, response rates of less than 20 percent are uncommon in library and information science. It is critical that claims of representativeness for small response rates produced from a sampling frame of 5,000 (basis of LibQUAL+) be treated with caution, especially where a culturally diverse student population represents a significant part of the campus community (Metoyer, 2000).

In some instances, it might be impossible to produce a sample reflective of a population, especially for those electronic services in which any-
one who has access to a library’s Web site may be a customer. There is also
need for methods of data collection on service quality that go beyond self-
reporting.

Data Analysis

The studies that have examined service quality have employed such
techniques as factor analysis, analysis of variance, discriminant analysis,
and quadrant analysis. Some have also produced mean scores for the ex-
pectation items and compared those scores to perception items. Different
methods of data analysis portray different things about the topic stud-
ied. Factor analysis is a statistical technique based on correlations that
group (load) a list of items from which a few dimensions can be identi-
fied. This allows a reduction of data in order to formulate more generaliz-
able observations about them. Analysis of variance is another statistical
technique used to compare the means of two or more groups in order to
decide if observed differences between them are significant or are a result
of chance. Discriminant analysis is a technique used to make predictions
about the classification of variables. In studies, such as ones on service
quality, this technique can help determine if a factor can predict satisfac-
tion among customers (Vavra, 1997, p. 349). Quadrant analysis provides a
graphic means of responding to the managerial need to determine how
to allocate remedial attention and resources to services. The chart typi-
cally is formed by the intersection of two axes: one represents importance
ratings and the other addresses performance ratings. The application of
this technique assumes that service managers listen to their customers
and allocate resources and attention in proportion to their voiced import-
ance of service attributes and perceived success in service delivery (Vavra,
1997, pp. 311-12; Hernon & Altman, 1998, pp. 198-202; Nitecki & Hernon,
2000).

Where Do We Go from Here?

Any emerging model of service must pursue whether or not there is a
“causal link” between service quality and customer satisfaction (Teas, 1993),
either overall or specific service encounters, and identify the basic dimen-
sions of service quality for libraries. That depiction must show where (or
if) behavioral intentions fit and how it results in improved service provi-
sion. An important question is “Does service quality, either directly or in-
directly, have any impact on outcomes assessment?”

As libraries continue to provide remote access to resources and ser-
dices and to support distance education, the value of looking at the Gaps
Model increases in importance. Research might also see if all five Gaps
contribute to a service model. As well, it is important to look more closely
at expectations and perceptions and value and excellence. Can service
quality be examined from both specific service episodes and global
perspectives, as is done with satisfaction, and the insights gained applied to a service model? Can research go beyond measures of perceptions and move to address the even more challenging questions of what value library services offer? How do customer perceptions about the benefits, delivery, costs, and so on associated with library services affect the efforts of libraries to improve the quality of the services offered? Case studies, for instance, might examine such questions and see how (if) library service plans and goals change over time.

Some Other Assessment Approaches

Many successful high performing companies have developed an assessment process that is central to their improvement of the services they provide. They challenge leadership and staff, systematically gather data, analyze and communicate results of their data-gathering efforts, and develop and implement improvement plans. Criteria used to evaluate and recognize the success of such assessment programs have emerged as components of national and international recognition and certification programs. Among their evaluation criteria, these programs commonly address the need to discover customer requirements and views of what they receive from the company. In other words, the basis for service quality—the relationship between customer expectations of quality and perceptions of performance—plays a central role in overall assessments of a company’s success. Though few U.S. libraries participate in the rigorous evaluation process to compete for the awards or register for the certification, awareness of some of these efforts for improving business organizations may trigger ideas about how to improve service quality through assessment in research libraries.

The Malcolm Baldrige National Quality Award, a program legislated by the U.S. Congress, in 1987 (see http://www.quality.nist.gov/law.htm), recognizes businesses, government agencies, and other organizations for satisfying the expectations of customers, and the award creates a means to share best practices among organizations. The intention of the award goes beyond honoring organizations to stimulate them to improve quality and productivity (Hagen, 2000b, p. 32). Among its seven criteria areas, it includes methods by which an organization ascertains its customers’ satisfaction. Extensive feedback through self-appraisal guidelines, program examinations, and audits provide an educational tool for organizations participating in the program. The Baldrige Award, as well as related regional, state, and local awards, has value as an advertising tool and as a method to motivate staff. Awards comprise a means to encourage and praise staff; such value should be neither ignored nor under-appreciated.

ISO 9000 (9001-9003) is an international standard for quality systems that provides a method for certifying companies that meet its requirements. Originally published in 1987 and revised in 1994 and 2000, it speci-
fies twenty elements for a company to address to assure its customers that it provides the services and products promised. Like the Baldrige Award, the ISO standard is customer and process oriented, and it includes criteria on identifying customer requirements and measuring customer satisfaction with the company’s performance. Libraries outside the United States have investigated, or might be mandated to apply, the criteria of the ISO standard to their operations. For example, the Nordic Council for Scientific Information and Research Libraries (NORDINFO) undertook a project in 1993 and 1994 to “step up quality in the LIS sector by gathering and passing on experience of the application of ISO 9000 certification” (ISO 9000 for Libraries and Information Centers, 1996). As the report on the project noted:

The ISO 9000 series does not serve to standardise quality goals. . . . .
What the ISO 9000 series does standardise are the requirements of quality systems. . . . . Among the . . . elements which are central to the management philosophy of the ISO 9000 series are the involvement of the subject—they, the LIS organisation—in the formulation of the requirements for which it will be certified and its ability to monitor compliance with those requirements itself. (p. 5)

The American Satisfaction Index (ASI), initiated in 1990 at the University of Michigan, is based on a Swedish program. The ASI is created from data regularly gathered on more than 200 companies and government agencies through interviewing thousands of consumers. The survey’s goal is to understand the impact of quality on the gross national product (GNP), national competitiveness, and the U.S. standard of living. It tracks trends in consumer satisfaction with products and industries. Although gaining in popularity among financial analysts and drawing attention to the need for the inclusion of customer viewpoints, the index does not address measurement techniques for service quality; it focuses exclusively on satisfaction.

Numerous other awards exist and focus attention on the importance of quality as judged by customers and on the need for developing methods for the identification of customer requirements that can guide an organization’s improvement management plans and processes. The U.S. Office of Personnel Management, for instance, administers the President’s Quality Award Program that, among its four purposes, provides “models that other organizations can use to assess their overall performance in delivering continuous value to customers” (Mehta, 2000, p. 57). Government agencies, businesses, and international associations are widely adopting the quality performance and assessment guidance that award programs offer organizations (Hagen, 2000a, p. 57). Their established methods of assessment techniques used to gauge customer expectations and perceptions of performance might provide new perspectives on how to assess service quality in research libraries.
CONCLUSION

The general perceptions versus disconfirmation debate should include contributions from LIS researchers. LIS should be integral (not tangential) to that debate. After all, whatever decisions made about service quality as a concept and its relationship to behavioral intentions should reflect a wide range of service settings. Thus, more LIS research should be placed in non-LIS journals.

It is troubling to see some accrediting bodies discredit the value of service quality and satisfaction, preferring instead for the institution to focus on learning outcomes. Such thinking ignores the role of research outcomes and, most importantly, how customers' views of quality have an impact on outcomes. Outcomes assessment is important but so are service quality and customer satisfaction. The mosaic of evaluation components (e.g., performance and outcomes measures, service quality, customer satisfaction, and effectiveness) will only grow. It is up to the profession to settle on those aspects most useful for planning and diagnostic purposes. The need to listen to customers will continue to increase as libraries align services with expectations, remain competitive, provide more services to remote users, and ensure that their institutional mission and vision are realized.

NOTES

1 Stakeholders "have an interest in the organization, usually related to funding... [They] may exert influence, primarily through funding or legislation, but they are not customers" (Hernon & Altman, 1998, p. 5).
2 Adapted from Reeves and Bednar (1994, p. 437).
3 This point addresses the other four gaps defined in the Gaps Model that contribute to the delivery of service quality.
4 Presentation by the research team (Fred Heath, Colleen Cook, and Bruce Thompson) at ALA Midwinter Meeting, 1999, San Antonio, Texas.
5 It is interesting to note that in the state of Minnesota, state agencies conducting satisfaction surveys are expected to get a return rate of at least 70 to 75%. See Minnesota Office of the Legislative Auditor (1995).
6 Comment by the research team (see note 4).

REFERENCES


Performance, Processes and Costs: Managing Service Quality with the Balanced Scorecard

Roswitha Poll

ABSTRACT
A German project, sponsored by the German Research Council, uses the Balanced Scorecard as a concept for an integrated quality management system. Performance indicators across four equally significant perspectives—users, finances, internal processes, and potentials (innovation)—are combined to produce a "balanced" evaluation of the library. The project is a joint effort of the University and Regional Library Münster with the Bavarian State Library Munich and the State and University Library Bremen. The three libraries are among the largest in Germany, each with special activities and operating conditions. Thus the project takes a broad view of management issues in academic libraries. Work started in June 1999 and will be finished in autumn 2001. The results will be published in a handbook including software that will enable academic libraries to establish an integrated controlling system and to collect and evaluate performance as well as cost data for management decisions.

QUALITY MEASURES
The mission of libraries is generally to provide and deliver information for the needs of a specified population. Other tasks—e.g., legal deposit rights, preservation of rare materials, or special collections in a nationwide program—are, in most cases, subservient to the main purpose.

Therefore, the best testimony for a library’s quality would be the influence of the library’s products and services on the information literacy of its population. For academic libraries, that would be the library’s impact on the educational process and the research results in the university.

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Libraries have tried to find and test quality indicators that might prove the direct effect of their activities on the academic population (compare Hiscock, 1986; Self, 1987; Wells, 1995; de Jager, 1997). Some such indicators that were proposed include: students’ success compared to library use; years of studying time compared to library use; and number and/or impact factor of research publications compared to library use.

But the direct influence of the library remains doubtful. If frequent library users get better marks, this might well be attributed to their general application and industry, using every means of information more intensively than others do. And faculty have many ways of finding information for their research, the library being only one of them.

In order to show their value for education and research, libraries have therefore developed more indirect measures of evaluation, such as studying the use of their collections and services; the speed of delivering information and services; the accuracy of delivery; the costs of the library’s products and services; the adequacy of processes; and the satisfaction rate of the population served.

When libraries substitute these measures with more direct outcome measures, they assume that high use (library visits, issues, reference transactions) indicates benefit to users’ information needs, that quick and reliable delivery will heighten this benefit, that cost-efficiency and well-organized processes will set resources free to enlarge and improve services, and that user satisfaction indicates good performance.

**The Stakeholders’ Views**

Libraries have developed sets of statistical data, performance indicators, cost analysis data, and user and staff surveys in order to assess the quality of their products and services. They must, however, keep in mind that there are certainly different views as to what service quality in libraries actually means. Quality concepts usually name as the library’s “stakeholders” the population served, the institution, financing authorities (which must not correlate with the institution), staff, and the general public. The two most interested stakeholder groups are the population the library is set up to serve and the institution to which it belongs.

The users’ view as to library service quality concentrates on the fulfillment of their special needs. In other words, the library is good if I get the material I need at once or at least with quick delivery, if I get correct information and help the moment I need it, if I always find a seat and well-functioning equipment in the library, and if I feel well in the library.

Service quality in this sense could be assessed with data like: opening hours, availability of requested titles, delivery time for books out of closed stacks or by ILL, percentage of material in open stacks, queuing times at reference desks or computer stations, and seating occupancy. Data out of satisfaction surveys could corroborate the aforementioned indicators.
The institution, especially if it provides funding, will see library quality on another scale—i.e., the library is good if it helps to shorten studying time, produces graduates that quickly find a job, supports research in an effective way, helps to raise the image of the institution, and if it is cost-effective overall. The last issue will often be the most important when resources are scarce.

Indicators for these issues might be the market penetration of the library, high use statistics, acquisitions expenditure per member of the population, library costs per student, and user satisfaction. There are, of course, other concepts of service quality—e.g., from the point of view of the library’s staff or the responsible ministry of science.

**DATA FOR THE PROJECT**

The current process of reforms in the academic sector favors financial autonomy of universities. Universities will work with an overall budget and will be able to decide independently on its use. Mechanisms of input-oriented regulation are replaced by performance indicators supporting allocation of budgets. Such indicators are, for instance, “number of graduates per term,” “length of study time,” and “proportion of research projects funded externally.” Indirect service institutions, like the central administration, the computer center, and the library, are included in this trend and must prove the quality and cost-effectiveness of their services for education and research.

In previous years, libraries have developed, tested, and standardized methods for the evaluation of their products and services. The project at Münster relied especially on handbooks, standards, and projects in which the library had cooperated earlier.

**For Statistics**

**For Performance Measurement**

**For Cost Analysis**
In addition, the library has implemented its experience in staff satisfaction surveys, regional surveys of library operating data, and process evaluation by commercial firms. Thus, a large collection of data is available for the evaluation of services. Table 1 shows data that could be used for assessing the quality of the lending service.

Table 1. Possible Data for Assessing Lending Service Quality.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active users</td>
<td>40,999</td>
</tr>
<tr>
<td>Issues per year</td>
<td>990,987</td>
</tr>
<tr>
<td>Availability of requested titles</td>
<td></td>
</tr>
<tr>
<td>in the collection</td>
<td>87%</td>
</tr>
<tr>
<td>for direct use (not lent out)</td>
<td>63%</td>
</tr>
<tr>
<td>Time of document retrieval in open stacks</td>
<td>3 minutes</td>
</tr>
<tr>
<td>Book processing time</td>
<td>25 days</td>
</tr>
<tr>
<td>Cost of one issue (staff costs, operating costs, building costs,...)</td>
<td>1,80 DM</td>
</tr>
<tr>
<td>User satisfaction with lending system</td>
<td></td>
</tr>
<tr>
<td>(from 1 = very satisfied to 5 = dissatisfied)</td>
<td>1.9</td>
</tr>
<tr>
<td>Satisfaction of lending staff with their job</td>
<td></td>
</tr>
<tr>
<td>(very satisfied/satisfied)</td>
<td>95%</td>
</tr>
</tbody>
</table>

Comparison between data from satisfaction surveys and more “objective” performance indicators showed that there may be vast gaps. In the user satisfaction survey of 2,000 users, responses indicated that, on average, 60 percent of the material users wanted was not available (it was either lent out or in in-house use). An availability study showed a rate of only 37 percent. Though it is quite understandable that disappointed users overrate the frequency of failure, the example shows that several methods must be used to get relevant management data. The quantity, diversity, and complexity of management data collected by libraries stresses the need for an integrated system that connects strategy, evaluation, and action.

**The Balanced Scorecard**

The tool chosen for the management system is the Balanced Scorecard (see Kaplan & Norton, 1992, 1996), a concept originally developed for the commercial sector. The concept "translates" the planning perspective of an institution (mission, strategic vision, and goals) into a system of performance indicators that covers all important perspectives of performance—i.e., finances, users, internal processes, and improvement activities.

The system thus integrates financial and nonfinancial data, input and output data, the external perspective (funding institutions, users), and
the internal perspective (processes, staff), goals and measures taken, and causes and results.

The basic model of the Balanced Scorecard, adapted to the conditions of academic libraries, deviates from the original model in placing not the financial, but the user perspective, foremost. Libraries do not strive for maximum gain but for best service.

![Figure 1. The Balanced Scorecard.](image)

The indicators chosen for the user perspective correspond to the fundamental goals of reaching as large a portion of the population as possible and of satisfying their information needs by the services offered: (1) market penetration (percentage of the population registered as actual users); (2) user satisfaction rate; (3) opening hours compared to demand; (4) cases of use (issues, in-house use) per member of the population (use of electronic resources to be included as soon as possible); and (5) immediate availability—percentage of immediate loans over total number of loans (including reservations and ILL).
The last indicator shows whether the collection covers all topics asked for by users and whether there are sufficient copies. Two indicators assess the use of electronic services offered by the library and the growing portion of that use coming from outside the library: (1) the percentage of the population using electronic library services, and (2) percentage of remote accesses to electronic library services of all accesses. The indicators for the financial perspective answer the question regarding whether the library is functioning in a cost-effective way. The goals comprise low costs per instance of use or per product and a high proportion of the total budget spent on the print and electronic collection. These indicators include:

- total costs of the library per member of the population;
- total costs of the library per case of use;
- acquisitions expenditure compared to staff costs; and
- percentage of staff costs per library service/product to total staff costs.

A last indicator shows the allocation of resources to the electronic library:

- percentage of acquisitions expenditure spent on electronic media.

For the perspective of processes, the underlying goals are to organize all processes in a way that, in spite of budget restrictions, allows space for investment into new developments and improvement of service. The indicators pick out background activities as examples of process organization:

- acquired media per staff year (staff persons in the processing department counted as FTE);
- average media processing time; and
- number of stages involved in providing a product/service (for every library service).

Again, one indicator was chosen to show the allocation of resources to the electronic services:

- percentage of all staff costs spent on electronic services and provision of electronic media.

The last perspective, named "potentials," describes the capability of the library to cope with the challenges of the future and its ability to change and improve. The institution's support for the library is indicated by the budget it allocates to the library; its expenditures for Information and Communication Technology (ICT) prepare the infrastructure for technological development and, the main factor for all development, the staff, is represented by two indicators for teaching and engagement:

- library budget as a percentage of the institution's budget;
- percentage of current expenditure for information and communication technology;
- number of formal training hours per staff member; and
- number of short-time illnesses per staff member.

**Strategy with the Balanced Scorecard**

One great advantage of the Balanced Scorecard is that it can visualize relationships of cause and effect among target values, evaluation data, and actions taken. Figure 2 shows the planning process from the definition of goals and target values, and the choice of adequate indicators, to the actions that the library takes to achieve the target values.

![Diagram of the Balanced Scorecard planning process.](image)

Figure 2. Managing with the Balanced Scorecard.

As the mission of academic libraries is, in many aspects, identical, the indicators system of the project described here might be used as a reference model for benchmarking purposes. Individual variations in libraries can be expressed by different target values and operational actions. Thus, a library whose main task is to provide basic information for students will further the use of electronic media by offering multimedia learning
material. A special research library, however, would perhaps offer its scientific journals in electronic form to achieve the same result. In spite of such differences, benchmarking would be possible.

The implementation and continuous use of the Balanced Scorecard demands a large set of data. The project has developed a special tool named Library Audit based on a system of data analysis, Online Analytical Processing (OLAP), that allows the multidimensional and flexible analysis of data collections. The library in Münster has already filled Library Audit with extensive data regarding the library’s products and services. Benchmarking data from other libraries are added continuously. Many of these data will not be used in the strategic evaluation of the Balanced Scorecard, but the large data pool can be useful for many operational problems.

The number of indicators for the Balanced Scorecard has been purposely kept small in order to avoid a flood of data without direct relevance for strategic management. When choosing the indicators for the Balanced Scorecard, the project libraries were focusing on the concept of the hybrid library that combines electronic and traditional library services in a comprehensive function. Structuring and implementing a scorecard model for a library demands a clear formulation of mission and strategic goals—a duty that has not yet been performed by every academic library.

The most important issue in the integrated controlling concept is not to look at different quality aspects separately, but to keep them all in view. The following shows the steps of measuring quality in collection building:

1. The costs per document processed are low. Does that mean that there are backlogs?
2. Processing time proves quick and adequate. Processes are well organized, but perhaps there is no time for claiming overview orders?
3. Claiming is done regularly and in good time. Maybe staff is overworked and absence rates are rising because of illness?
4. Illness rates are quite normal, and a staff satisfaction survey shows high satisfaction with the job.

Everything looks fine, but collection use is declining, and a user survey shows dissatisfaction with the collection. Apparently much well-organized labor has been spent on the wrong material. The example shows that service quality has many aspects—the Balanced Scorecard attempts to integrate them. The project will be finished in 2001 and will result in a handbook including the software Library Audit. A first direct outcome is an initiative in Nordhrein-Westphalia, where seventeen university libraries consented to use a set of “ten core data” that relies on the Balanced Scorecard project. The core data are grouped as to input, services, and usage.
Input
- Acquisition expenditure per capita (members of the population served)
- Proportion of acquisition expenditure spent on electronic documents
- Library costs per capita

Services offered
- Opening hours per week
- Immediate availability of the loan collection
- Percentage of PC-places of all user working places
- Processed accessions per employee man-year (this is the only indicator showing the efficiency of background processes).

Usage
- Market penetration
- Loans per capita
- User satisfaction rate

The objective of the “ten core data” initiative is to give a concentrated view of a library’s performance and to facilitate benchmarking between libraries of similar mission and structure. Such concentrated sets of data for the quantity, quality, and costs of the library will be indispensable for representing library services to institutions, funders, and the general public.

REFERENCES


Innovative United Kingdom Approaches to Measuring Service Quality

IAN WINKWORTH

ABSTRACT

This article reports on approaches to measuring the service quality of academic libraries that are innovative in the United Kingdom. Some of them will, it is hoped, also be innovative in the United States. The discussion is also intended to draw out particular themes where there are marked similarities and differences between the two countries. After a brief introduction to the UK national background of quality measurement, the article deals with four topics—measurement frameworks, better use of statistics, benchmarking, and measuring user satisfaction—before offering some suggestions about likely future developments.

THE UNITED KINGDOM QUALITY MEASUREMENT BACKGROUND

Despite widespread adoption of quality frameworks such as ISO 9000 or the various “Quality Award” systems in commerce, public services in the United Kingdom have, for the most part, not followed this lead. Yet there is growing pressure from national government and customers for accountability interpreted as the high quality services sought by customers. This disjunction is perhaps partly responsible, along with natural tendencies for a socialist government, for a growing culture of government bureaucratic enforcement of performance measurement for public services. This is typified by the setting of compulsory government-prescribed performance indicators, required comparison between similar organizations (e.g., different local councils or different schools), and compulsory publication of results to both customers and national government.

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As an example of this, we can look at recent draft proposals for twenty-five compulsory performance measures for public libraries. The public library service is the legal responsibility of the district or county council. But the legal framework controlling public libraries is set by national government. The 1964 Public Libraries Act required the provision of "comprehensive and efficient" public library services. But the definition of this was vague until the 1990s. In 1993, five compulsory performance measures were set, and each library authority must publish its results annually together with comparative results. From 1998, authorities were further required to submit a formal annual plan to the central government. The plan, among other requirements, must indicate how the authority will improve performance on the standard measures. It is now proposed (summer 2000) to extend the set of measures to twenty-five. A new concept is also proposed of a "target" level of performance and an "intervention point" for each measure. Frequently the intervention point is set at the level currently achieved by 50 percent of authorities while the desired level is that achieved by the top 25 percent, so there is a clear agenda of improvement as well as measurement. Some examples are given in Figure 1.

The strong role of national government in the United Kingdom reflects the political framework where most power and tax resources are held by the national government and the regional or local governments

<table>
<thead>
<tr>
<th>Measure</th>
<th>Target</th>
<th>Intervention Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>User satisfaction with helpfulness of staff</td>
<td>95% good+</td>
<td>90% good+</td>
</tr>
<tr>
<td>Active borrowers</td>
<td>45% of relevant population</td>
<td>30% of relevant population</td>
</tr>
<tr>
<td>Opening hours</td>
<td>45 hours per week for large branch</td>
<td>45 hours per week for large branch</td>
</tr>
<tr>
<td>Reservation turnaround</td>
<td>50% in 7 days</td>
<td>35% in 7 days</td>
</tr>
<tr>
<td>Bookspend</td>
<td>£3,500 per 1000 population</td>
<td>£1,970 per 1000 population</td>
</tr>
<tr>
<td>IT workstations</td>
<td>0.7 per 1000 population</td>
<td>0.35 per 1000 population</td>
</tr>
</tbody>
</table>

Figure 1. Examples of Twenty-Five Draft Public Library Performance Measures.
have their powers, and most of their funding, set by national government. In the United Kingdom, the national government can close a poorly performing school or remove the right of a local authority to run its schools if there is evidence of poor management. This is arguably the reverse of the U.S. situation, where the national federal government has only the powers ceded to it by the states, and local services are locally funded and controlled. So here is a first key difference between the United States and the United Kingdom. But there is also a key similarity in the generally growing pressure for more and better performance measurement and pressure for improved service quality.

Academic Library Quality Measurement Frameworks

Since higher education in the United Kingdom is predominately publicly funded through government agencies, it is no surprise that there is here, too, a sharp-edged and bureaucratic framework for the measurement of performance and service quality. Academic quality is competitively audited through three processes covering research, teaching, and quality assurance.

The level of core research funding for each university depends on a four-yearly "Research Assessment Exercise." For each of some seventy subject areas, universities and colleges are invited to submit a report on the productivity of the last four years and a plan for the next four. The supporting evidence required includes details of publications, project-specific research grants obtained, and other data. The submissions are peer-reviewed by committees of subject experts who assess the quality of research performed and likely future productivity against a seven-category scale ranging from "poor" to "major international significance." The resulting funding is based on the number of researchers and their overall performance as a group. The funding per researcher is zero for the two lowest categories, and from one to some five times the minimum amount for the higher categories.

The quality assurance process follows an audit model. The institution sets out its processes. An inspection panel then, once every five years, visits and checks whether the quality assurance processes are effective and makes suggestions for improvements.

The area which has the most direct effect on university libraries is the process for "Teaching Quality Assessment" (TQA). This is again currently based on periodic review (every six years) by a visiting inspection team for each subject area taught. There are approximately forty-two subject areas. Each subject visit to each institution results in a published report incorporating gradings against six "aspects" of teaching quality. The gradings go from one (fail) to four (excellent) for each aspect.

Low rating on any aspect results in the threat of closure of the courses concerned and withdrawal of funding for them unless satisfactory reme-
dial action is taken within twelve months. In theory, there is no overall grade but, of course, in practice, institutions and compilers of league tables cannot resist totaling the scores to give an overall grade (e.g., “twenty-three out of twenty-four” or 72 percent) and then aggregating scores for all the subjects reviewed to give some kind of overall teaching quality comparative metric. It seems likely that very few prospective students, parents, or employers ever read the individual reports. Any public relations outcome, good or bad, is also suffused within many other factors (mainly prejudice!). But the system has undoubtedly focused minds very hard on achieving holistic quality of the student experience. Over time, average scores have risen. Cynics ascribe this entirely to growing expertise at “playing the system.” There is no doubt about some of this, as well as fewer tactical errors by institutions making claims they could not substantiate, but there has actually been objective improvement, too.

Improvement can readily be demonstrated by reference to the library aspects of Teaching Quality Assessment. Library services are reviewed under a broader “Learning Resources” aspect, which also covers teaching facilities, laboratories, any departmental libraries, and so on. The guidance to assessors on reviewing libraries boils down to three questions:

1. Is there an overall learning resources strategy consistent with the course aspirations?
2. Are library services available, accessible, and appropriate in terms of . . . stock, study space, induction, opening hours, and user support?
3. Is there effective liaison with subject staff?

The answer is based prominently on student feedback, also on assessors’ own judgments, evidence offered, and conversations with library and teaching staff. The assessors “triangulate” the answers from each source and are particularly sharp about inconsistencies and whether the “learning resources” answers fit with what they have been told about curriculum, student workloads, and so on.

The Standing Conference of National and University Libraries (SCONUL) has been involved in shaping the process through lobbying the (successive) agencies concerned over the last eight years and offering advice and guidance (sometimes accepted) to improve on the early poor and patchy handling of library issues. Specifically, the official guidance to assessors reflects and is supplemented by a “SCONUL aide-memoire” which fills out for assessors the three basic questions and suggests what kinds of answer might be acceptable. There has also been a significant local effect. The impending arrival of a subject review significantly increases academic keenness to talk seriously and systematically to library colleagues, and libraries can build on this by using the SCONUL aide-memoire as a kind of script for these discussions. SCONUL has helpfully provided libraries with a further aide-memoire which fleshes out the kind of answers we believe
assessors will be looking for. These answers are not prescriptive or num-
ber-based. The core is to look at how effective liaison, resourcing, and
monitoring takes place. Finally, in this area, SCONUL continues to moni-
tor how the process works and what the reports say for evidence of progress
or backsliding.

In terms of library-specific measurement frameworks, the most com-
plete is “The Effective Academic Library” (Joint Funding Councils Ad-hoc
Group on Performance Indicators for Libraries, 1995). This was drawn up
in response to a recommendation in the 1995 Follett Report (Joint, 1993)
that “a coherent and generic” set of performance indicators for academic
libraries should be developed. It might be argued that this was a classic
piece of buck-passing from a report which made its major contributions in
respect of obtaining national funds for library buildings and the develop-
ment of electronic library services.

“The Effective Academic Library” takes a broad approach, incorpo-
rating a mixture of numerical and other indicators, formulated sometimes
nationally and sometimes locally. In all, the report suggests thirty-three
indicators split into five facets of performance. The five facets are:

- Integration (relevance to institution)
- User satisfaction
- Delivery (meeting targets; output)
- Efficiency
- Economy

An initial consultation with vice-chancellors (who, of course, mostly
passed on the task to their librarians) produced many long replies and no
consensus. If there was a typical response, it ran something like “There
are too many indicators here . . . please add one on . . . .” After a year’s
pause, the agencies which fund higher education passed the issue to the
Committee of Vice-Chancellors and Principals, who passed it on to
SCONUL. Later sections of this article will describe the outcomes, but it
might be argued that at least the beginning of a “coherent and generic”
set of indicators has now been established.

There has been work in the United Kingdom on two other issues
which bear on the framework question. One is the notion that there are
multiple stakeholders with different performance measurement require-
ments. For example:

- End-customers: students
- Service purchasers: academic departments, institutions
- Funders: funding councils, government, the taxpayer
- Guardians of quality: QAA, professional bodies
- Service managers
- Staff
John Crawford of Glasgow Caledonian University has been particularly active in carrying out research to identify the key issues for different groups and assess how far they overlap. This is an important insight, often overlooked and often responsible for fruitless debate about which are the right indicators to use. Which are right depends, of course, on the audience and the purpose.

An acknowledged omission from "The Effective Academic Library" were any indicators for electronic services. There is no need here to recap the difficulties in achieving this. Suffice to note that everyone wants indicators, and no one has satisfactory answers. SCONUL has tackled this issue by relying on the work of funded researchers on United Kingdom and European Community projects. These are currently coming to fruition through the EQUINOX project. EQUINOX combines a suggested set of twelve electronic indicators with a software package designed to demonstrate the linkages between each indicator and library (and institutional) objectives. The full set of indicators are shown on the Web site. Examples include: percentage of target population reached by electronic services; number of "sessions" per head; cost per session/document delivered; and percentage of activity which is electronic. Currently there seems to be some diverging of the paths between the European researchers and their equivalents in the United States. It is hoped that this gap can be closed again. In any event, SCONUL libraries (as well as libraries in some other European countries) are currently testing the EQUINOX products.

Better Use of the Statistics

Like their American cousins, United Kingdom academic libraries have been collecting statistics for many years. But it has to be admitted that, in 1995, there were still many failings. The statistics had achieved little recognition outside libraries. Analysis, presentation, and interpretation of the data were all poorly developed. Several attempts at a conceptual framework had failed to achieve acceptance. Overall, impact had been limited, particularly given the effort that has been spent over the years. The SCONUL Advisory Committee on Performance Indicators (ACPI), which has responsibility for this area, determined a number of steps to try to move forward, including:

- use of a professional statistical agency: Library and Information Statistics Unit (LISU), University of Loughborough;
- empirical testing of theory: the Cranfield Study;
- getting "official" recognition—HELMS (Higher Education Library Management Statistics);
- electronic submission of data; and
- joint work with university IT directors.
The United Kingdom is fortunate to possess a grant-funded specialist agency devoted to library statistics—LISU. For SCONUL, LISU has taken over data input and storage, created a ten-year database, and cleaned the data, filling some gaps and correcting obvious errors. It has then begun publication of an annual discursive "trends" volume (Standing Conference of National & University Libraries, 2000, for the latest issue), offered a customized statistical comparison service to individual libraries (allowing libraries to have created, to their individual specification, a selective set of results for selected comparator institutions), and is a useful source of expert statistical advice and data in electronic form. Figure 2 shows the kind of table which is included in the “trends” volume, giving comparisons over time and between broad groups of institutions. Figure 3 gives an example of the kind of local data that can be generated.

At Northumbria, the library has become concerned that use of conventional study seats is gradually falling off, leaving the facility with a growing waste of space. A two-week survey showed that, during this period, utilization of study seats barely extended beyond 50 percent at any time,
and the average was around 30 percent. It happens that one of the SCONUL data series is based on counts of occupation of study seats on specified sample days of the year. Figure 3 shows Northumbria’s results against the national average. Both show a gradual lowering of occupancy over seven years. The Northumbria decline is more rapid. This helps to confirm that it would not be imprudent for the library to consider removing some study seats in order to create badly needed shelf-space—or IT seats—or possibly return to the university some unneeded space.

The second strand in better use of statistics was to undertake some empirical testing of the alternative measures about which debate sometimes takes place: whether to use gross student numbers or numbers of students and academic staff as a divisor in ratios, and whether to introduce weighting of any kind; which output measures discriminate most usefully? John Blagden, former chair of ACPI, obtained research funds to employ a research assistant for one year to test the quality of the SCONUL data and explore the discriminatory power of various measures proposed in “The Effective Academic Library” and other international sources. The project was successful in answering many of the arguments and in generating a genuinely small set of proposed indicators which, after review by a group of university heads, have led to a new annual publication, “UK Higher Education Library Management Statistics” (HELMS), aimed at university administrators (Standing, 1999). This publication incorporates a number of new features for the United Kingdom. All institutions, not just members of certain library organizations, are included in principle—though not all choose to supply data. The library data are brought together with relevant data supplied by the official government agency for data about universities and colleges—the Higher Education Statistics Agency (HESA)—and is presented using templates supplied by HESA. Contact with HESA and university heads has led to the use of the term “management statistics” rather than measures or indicators and to the separation of two sets of “contextual data” about the libraries and the institutions from the management statistics. There are currently seven “Library Management Statistics” (FTE = full-time equivalent):

**Input Measures:**
- Total library expenditure per FTE user
- Expenditure on information provision per FTE user
- Expenditure on staffing per FTE user

**Output Measures:**
- Seat hours offered per week per FTE user
- Loans per FTE user
- (In the future: Stock on loan; electronic services; user education)
- Interlibrary loans as a percentage of all loans
There are six items of library contextual data, designed mainly to give an idea of scale of operation:

1. Number of libraries
2. Space occupied
3. Size of collection
4. Number of seats
5. Number of workstations
6. Total library expenditure

Finally, there are five items of institutional context data, designed mainly to give background on size and emphasis between teaching and research:

1. Number of FTE students
2. Percentage of postgraduate students
3. Percentage of part-time students
4. Number of academic and research staff
5. Government research funding as a percentage of all government funding

There is some evidence that this new approach has attracted the interest of some university heads. Depending on the circumstances, this interest may, of course, be felt as beneficial or otherwise. But it must be progress to feel that at least some of the decisions and judgments are partly based on data in which we have reasonable faith.

In the second year, graphic presentation has been added. In the future, we hope to improve coverage of institutions and to increase the output indicators to cover areas such as library instruction and electronic services. Figure 4 gives an example of the graphic presentation.

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**Chart 5 - Loans per FTE User**

- HE colleges
- New Uni.
- Old Uni.
- CURL

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*Figure 4. Loans Per FTE User.*
Within the graphics, initial attempts have also been made to relate inputs to outputs, not a common feature of library statistics. Figure 5 plots an output (loans per year per user) against an input (total expenditure per user). It is often assumed that there will be some correlation. Initial inspection of this graph does not offer any confirmation.

Figure 5. Expenditure Versus Loans.

Loans are only one output, and the graph produces more questions than answers. But this is surely the kind of analysis which is long overdue alongside the ritual demonstrations that resources are not keeping up with costs and user numbers.

**Benchmarking**

The SCONUL Benchmarking Pilots Project, 1997-99 (Town, 2000), has been a successful attempt to apply standard benchmarking approaches to libraries, rather as the Association of Research Libraries is building on SERVQUAL. Led by Stephen Town of Cranfield University, the project has set up six volunteer self-selected groups of two to five partners, each exploring a particular area of library service. Two have focused on advice desks, two on library skills training, and one each on “counter services” and the library environment. The project has based its work on detailed analysis and comparison using a wide variety of measurement techniques. Figures 6 and 7 give much simplified and compressed overviews of the methods and outcomes relating to aspects of two of the pilots: enquiries and physical space.

More details will be available in the “SCONUL Benchmarking Manual,” due to be published in December 2000. The manual is the major outcome of the project. It is designed to offer a practical “how to do it” guide based on standard methods, modified for United Kingdom higher education.
- Counter Services: Enquiries
  - Critical Success Factor: provide accurate answers to personal queries
  - End product: Correct answer
  - Processes
  - Benchmarks and method of testing:
    - Is service clear to customer? (Visit)
    - Answers accurate? (Mystery shopper)
    - Referral process? (Staff questionnaire)

Figure 6. Case Study Example 1.

- Library Environment: Physical Space
  - Critical Success Factor: space works appropriately
  - End product: Comfortable customer
  - Processes
  - Benchmarks: e.g.
    - Customer satisfaction (Customer survey)
    - Good planning (Visit / Checklist)
    - Amount of space (Library questionnaire / SCONUL statistics)

Figure 7. Case Study Example 2.

libraries. The benchmarking model used envisages a loose seven-stage process comprising: (1) Defining, (2) Partnering, (3) Agreeing, (4) Measuring, (5) Collecting, (6) Analyzing, and (7) Acting. In practice, the seven stages are rarely as distinct as shown and may sometimes be carried out in parallel.

Added to the overall model are case study reports from the pilot projects, which give an excellent insight into the issues and benefits of benchmarking.

**USER SATISFACTION**

The final United Kingdom initiative to be covered is the SCONUL User Satisfaction Project, 1998-99. Led by yet another ACPI member,
Jacqueline Whiteside of Lancaster University, this project was the third or fourth attempt at a standard nationally used user satisfaction assessment method. The aim was to devise a popular method which would be easy to use and would also generate a database of comparative data which might help to establish whether a local user satisfaction rating of 70 percent equaling “good” indicates a good, bad, or indifferent situation. The innovative aspects included:

- working with a commercial agency—Priority Search Ltd.;
- new data collection methods using a digitizer tablet and light pen to read questionnaires;
- use of specialist software to analyze data and present the results; and
- innovative graphic presentation of the results.

The questionnaire is composed entirely of tickboxes to permit machine reading, with sets of questions on how successful users were in using particular services, how satisfied they were, how important particular services were, whether expectations had been met (an echo here of the SERVQUAL methodology), use of other libraries, and satisfaction and importance overall. Figure 8 shows a specimen output from the pilot project.

Each bar represents the result for one of the pilot group of libraries, with an indication of the number of questionnaires and the average score achieved. It is interesting that the method achieves statistically significant

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**Note:** The figures on this graph are not percentages, but weighted averages.

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*Figure 8. Libraries Rated for Course Books and Essential Texts.*
results with quite small numbers of questionnaires in each library. The horizontal scale plots positive and negative results against a notional -100 to +100 scale. The vertical line shows the average score for the whole group—fortunately slightly on the positive side of neutral. It can be seen that there are marked differences in ratings and why, therefore, the results are anonymous. The shading of the bars shows whether the difference from the mean is statistically significant or not. The project report will itself provide a useful broad benchmark of scores for different services. The report can point to an apparently useful standard method for further testing and a database of results for comparison. One additional result of interest is that people who have used other libraries tend to be about 10 percent more critical than those who have not.

The technology and methods are already in use in a significant number of United Kingdom libraries. In local surveys, a recommended technique is to ask respondents to rate the relative importance of two randomly generated statements about possible improvements in library services. The statements are generated as a result of focus groups with users rather than by a priori guessing by library staff or researchers. The computer then randomly generates pairs of statements (e.g., “more study seats” versus “longer opening hours on weekends”; “more catalog terminals versus more user education”). Figure 9 shows the kind of matrix a respondent is asked to complete.

The outcome is a list of desired improvements in a prioritized order—not just an unquantified wish list, something which Northumbria has applied usefully in review of our IT facilities.

CONCLUSIONS AND THE FUTURE

In the last five years, there has been innovative progress on a number of fronts, some more successful than others. At the very least, some of the long-standing roadblocks have been moved or shifted to one side. For the future, the key objective is to continue this work, taking advantage of opportunities that arise from developments in other sectors or countries. The draft plan for SCONUL includes:

- continue with a search for better presentation, interpretation, and publicity;
- review the items collected and the use made of them by a sample of libraries (a new 1999/2000 project);
- encourage use of the customized comparison service from LISU;
- encourage adoption of the benchmarking method;
- more use of standard instruments, including the User Satisfaction Method;
- incorporate measures for electronic services;
<table>
<thead>
<tr>
<th>Library users' ideas</th>
<th>This side very much more important</th>
<th>This side quite a lot more important</th>
<th>Both sides just as important or unimportant</th>
<th>This side quite a lot more important</th>
<th>This side very much more important</th>
<th>Library users' ideas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide more help/guidance in using the library catalogue</td>
<td></td>
<td></td>
<td></td>
<td>Provide more help/guidance in using the library catalogue</td>
<td>Provide more help/guidance in using the library catalogue</td>
<td>Purchase more new books</td>
</tr>
<tr>
<td>Open longer at weekends</td>
<td></td>
<td></td>
<td></td>
<td>Provide more formal training in using electronic resources</td>
<td></td>
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</tr>
<tr>
<td>Provide more copies of key texts</td>
<td></td>
<td></td>
<td></td>
<td>Allocate more staff to shelving books/journals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open earlier in the morning on weekdays during the semester</td>
<td></td>
<td></td>
<td></td>
<td>Help/guidance in using the library catalogue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provide more dedicated catalogue terminals in the library</td>
<td></td>
<td></td>
<td></td>
<td>Ensure the library catalogue is accurate and up to date</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How Could the Library Provide You with a Better Service? Important: Place a Cross in Only One Box on Each Line.

Figure 9. Sample Response Form.

- renew the search for a satisfactory overall framework for performance measurement (EAL2? UK Balanced Scorecard?); and
- perhaps, if ARL is willing, LibQUAL+: the UK Pilot?

It is stimulating for a United Kingdom librarian to see the potential of cross-Atlantic collaboration. It is hoped that some of the work reported here will strike a chord with librarians in the United States and elsewhere.

REFERENCES


International Variations in Measuring Customer Expectations

Philip J. Calvert

Abstract
One of the problems with using gap analysis is our partial understanding of customer expectations. A survey of Chinese university library students' expectations of service quality was compared to a similar survey done previously in New Zealand. Marked similarities in results show that there is perhaps a global set of customer expectations that can be used to measure academic library service quality. Three dimensions that concern staff attitudes, the library environment, and services that help the customer to find and use the library's materials efficiently, are found in both studies. A secondary study investigated national culture as a source of attitudes to customer service. Using Hofstede's dimensions, Library and Information Science (LIS) students in China and New Zealand were compared. Apart from some variation in the role of the manager in setting service standards, little variation appeared. The two surveys both suggest that national culture is not a major precursor of attitudes to service quality, so it will not impede efforts to set international measures of service quality for libraries.

Introduction
The increased emphasis on customer care seen in the 1980s and 1990s has also affected university libraries around the world and, as a result, the need to understand what library customers expect in terms of service quality is now necessary for good management. Service quality can be defined in different ways, but the most common approach used in libraries is...
disconfirmation theory that examines the difference between a customer’s expectations and the customer’s perceived sense of actual performance. Surveys look for the extent that customer expectations of service are disconfirmed in practice; this is also called “gap” analysis. The SERVQUAL model of establishing service quality by employing gap analysis has been used in libraries for several years, and research shows it “offers service providers a diagnostic tool to assess what is important to meet or exceed their readers’ expectations for quality service and a monitor of how well they do so” (Nitecki, 1998, p. 190).

Quinn (1997) argued that customer expectations can only be assessed by professionals, yet it has been established that customers and librarians have different expectations of the library, and “If there is a lack of congruence between users’ expectations and providers’ expectations, service quality will suffer regardless of how well services are planned, delivered, and marketed” (Edwards & Browne, 1995, p. 164). Hernon, Nitecki, and Altman (1999) say the belief that librarians already know what customers want, need, and expect is one reason they have been slow to accept the need to investigate service quality (p. 13). Customers have expectations about the service they will receive from an organization, and it is widely accepted that the key to good service quality lies in providing performance that meets or exceeds customer expectations of the service. That places the onus on library managers to know the expectations of their customers. Separately, but perhaps as importantly, a fuller knowledge of the origins, or antecedents, of customer expectations will provide management with a fuller understanding of the complex nature of service quality.

The twenty-four statements in SERVQUAL have been so thoroughly tested that their reliability and validity is well established (see Zeithaml, Parasuraman, & Berry, 1990). Still, doubts have been expressed about the SERVQUAL’s applicability to contexts not close to its original setting (Robinson, 1999, p. 29). Its generality, as opposed to the specific context of a particular service sector such as libraries, has encouraged some LIS researchers to try a variation of gap analysis. Hernon and Altman (1998) pioneered a method of comparing customer expectations with objective indicators of service quality (p. 106) that has been tested in academic libraries in the United States, New Zealand, and Singapore (Calvert, 1997). This method is, in essence, similar to SERVQUAL but uses statements developed in consultation with library staff and customers that cover a wide range of aspects of service quality in libraries, though even the large number of statements generated so far cannot be said to be comprehensive. It also has the merit of being flexible enough to allow individual libraries to frame survey questionnaires to suit their own needs.
SEARCHING FOR GLOBAL DIMENSIONS OF LIBRARY SERVICE QUALITY

A problem with the gap model is that we have an inadequate understanding of customer expectations. Nitecki (1999) has pointed out that most research into library service quality has been case studies and has not produced normative results. She said: “Additional investigation is needed in library settings to draw insights about what library users find important in judging service quality and to speculate if universally prioritized factors exist across all library settings” (p. 225). In this project, it was hoped that, by investigating customer expectations in Chinese university libraries, the results would aid researchers around the world to move toward Nitecki’s ideal of a global understanding of customer expectations. Comparisons between the Chinese results and those from a similar survey conducted in New Zealand will add to our understanding of customer expectations.

PRECURSORS OF SERVICE QUALITY

Writers have identified different precursors of customer expectations. The SERVQUAL authors list word-of-mouth communication between customers; the personal needs of customers; past experiences of customers; and the external communications from service providers (Zeithaml, Parasuraman, & Berry, 1991, p. 19). A list produced from an LIS perspective included word of mouth, customer’s prior experience, and competitive behavior (Hernon & Altman, 1998, p. 11). To those lists, the impact of national culture can be added. The resulting six factors can be configured as follows:

The customer:
1. past experience of the customer;
2. word-of-mouth from other customers;
3. personal needs of the customer; and
4. national culture of the customer.

The service provider:
5. communications (direct and indirect) about what the customer can expect.

Competitors:
6. service provided by other providers that acts as a benchmark.

There seems to be no research that tries to establish priority among the various sources of expectations. Millson-Martula and Menon (1995) say that “needs” may be accorded the most worth because of their supposed objectivity; yet, however true this may be, personal needs vary so much between customers that management will find it extremely difficult to incorporate any knowledge of individual needs into strategic plans. Only when a pattern of needs emerges is the information of value.
Of the other four factors given in the literature, the most influential in forming expectations is likely to be the customer's personal experience of the service. In a project that examined the relationship between customer perceptions and expectations of a public library service, British researchers concluded: "User's experience has emerged as the most important factor impacting on the way that they form expectations and perceptions of the service." It was the "snapshot" of service received during a service experience that had a significant impact on perceptions, and also that subsequent expectations were formed as a result of the experience (Lilley & Usherwood, 2000, p. 16). A series of such encounters will form the customer's expectations of service quality. A practical difficulty that results from this is that expectations are likely to change with familiarity (Carman, 1990) so, if possible, the level of familiarity should be gauged along with the expectations or, alternatively, take only the views of individuals with experience of the service and use their responses as a norm for all customers' expectations (Robinson, 1999, p. 28). Chinese university students will have had few true library experiences prior to starting a degree, for school libraries are nonexistent throughout much of the country and rudimentary where they do exist. This is not so in New Zealand, so the impact of school library experiences on university student expectations needs to be borne in mind as a possible factor, though this research has not produced any conclusions about its effect.

Presumably, word-of-mouth communication is a by-product of personal experiences of the library by different individuals who then share the knowledge they have gained with their friends. This might be modified by library communications, but it seems as though it is the personal experience that has the strongest effect—as one might intuitively expect. As libraries raise their marketing efforts, they will presumably be conscious of the impact their messages have on customer expectations. Indeed, marketing services can help to create reasonable expectations of a service before it is experienced in person, as can the use of service level agreements, provided they are widely publicized. Both Chinese and New Zealand university libraries produce written material introducing customer services, and they are increasingly using Web sites to promote access to electronic services, so this will surely have some impact on expectations. This sort of promotion runs the risk that unmediated customer use of electronic services may result in some very unhappy "snapshot" experiences. Marketing is also important in changing those customer expectations that management believes are below a desirable level. For example, the University of Waikato discovered very low customer expectations of "reader education" classes (or bibliographic instruction, as they might be called in North America) so set out to raise expectations in order that more students would take advantage of the classes offered (Harwood & Bydder, 1998).
Significantly, the research that produced most of these “factors” in forming attitudes to service quality has all emanated from the United States and so is representative of a single national culture. It is worth asking if the same antecedents of customer expectations will be found around the world or if national culture exercises a major influence on the formation of attitudes to service quality. Every person carries patterns of emotions and potential behavior learned throughout a lifetime. Much of this is acquired in early childhood from family members and the social environment such as friends, television, and pop music, and it forms what Hofstede (1997) calls “mental programs” that partially predetermine a person’s behavior (p. 4). People have a learned reaction to any given situation, so it would be logical to expect customer service to include many moments when cultural characteristics play a part in the behavior of the customer or staff member concerned. As an example, it could condition the response a staff member shows to a customer’s dress or speech, to the amount of certainty the staff member feels she must show in the answer provided, to the extent she shows personal initiative in seeking a satisfactory answer to the customer’s question and how much she might fall back on stock responses from a manual, even to how much the staff member attempts to impress superiors with her behavior. Later, this article will tentatively explore the potential impact of national culture on the formation of attitudes to service quality in library and information management. It is worth adding at this point that Hofstede did not claim that “mental programs” were unerasable, but he suggested that certain behavior might need to be unlearned while new behavior patterns are acquired.

Objectives of the Primary Project

There were two objectives set for the research reported here: (1) to compare the customer expectations among university library customers in China and New Zealand to identify similarities and differences, and (2) to produce global dimensions for customer expectations of academic library service quality.

Methods

Focus groups of between four and eight library staff were held in Peking and Tsinghua Universities in China. The focus group members were presented with a list of statements produced in New Zealand by Herron and Calvert (1996) and asked to consider their appropriateness to the Chinese situation. The statements on the list were amended and deleted according to the opinions expressed in the focus groups, with more statements being added to make the list truly representative of service quality as it is understood by university library staff in China. As an example of this, statements about drinking fountains were removed, but one on an adequate supply of clean water (for making tea) was added.
Although this reduced the comparability of the two lists, there was also a need to produce outputs useful to the hosting university libraries so that the final list of statements included some elements of compromise to achieve that result.

The statements were put into a questionnaire that asked library customers to rate their expectations of service quality in an "ideal" university library on each statement. The survey was completed by 135 customers (all of them students) in the two libraries.

The data were entered into SPSS running on a PC. The mean of responses to each statement was calculated for each university separately, then the combined mean for all 135 customers. Ranked lists with the highest means at the top were produced for each university and then for the combined means (Table 1). Both universities have been given their own ranked lists together with calculated means, so a by-product will be a list of statements that each individual university library will be able to use if they wish to conduct a separate analysis of service quality. A Spearman Rho correlation for the two universities was .73, perhaps lower than might be expected considering the similarity between the student bodies but significant nonetheless. Further analysis of the ranked lists for Peking and Tsinghua showed forty of the eighty-six statements within ten spaces of each other, showing considerable similarity on some aspects of service. At one university, statements on staffing scored quite highly while, at the other university, statements about the library's catalog ranked higher.

The data were subjected to principal component analysis followed by Varimax rotation. Nine factors could be produced using all eighty-six variables, but it required the removal of two statements before more factors could be produced and, once thirteen factors had emerged, it was not possible to produce more, even after forty rotations, without removing an excessive number of variables. Thirteen factors produced the most easily comprehensible output (see Appendix A). Reliability analysis of all thirteen factors produced high Alphas between .919 (the first factor) and .579 (the eleventh factor), showing that the results are robust. Only statements loading at higher than .4 are displayed.

**Comparison between Chinese and New Zealand Results**

Table 1 shows the combined means and resulting ranked list of statements from the two Chinese university libraries. Customers have said their expectations on the statement "It is easy to find where materials (books, journals, videos, maps, etc.) are shelved" exceed all others. If expectations are based on personal experience, then the sheer size of the two university library buildings at Peking and Tsinghua may account for this because students, in particular, will find it challenging to find what they need unless a rational layout supported by good signage aids them in their search for materials and service desks. A visitor to either one of the libraries
Table 1. The Mean of All Responses, Ranked from Highest Expectations to the Lowest.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Mean</th>
<th>St Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. It is easy to find where materials (books, journals, videos, maps, etc.) are shelved.</td>
<td>5.970</td>
<td>1.348</td>
</tr>
<tr>
<td>2. The information I get from library materials is accurate.</td>
<td>5.940</td>
<td>1.251</td>
</tr>
<tr>
<td>3. The library's Web pages contain correct and useful information about library services and materials.</td>
<td>5.904</td>
<td>1.304</td>
</tr>
<tr>
<td>4. Information displayed on the computer catalog is clear and easy to follow.</td>
<td>5.888</td>
<td>1.296</td>
</tr>
<tr>
<td>5. Study areas in the library are kept quiet.</td>
<td>5.858</td>
<td>1.322</td>
</tr>
<tr>
<td>6. Lighting in the building is adequate to my needs.</td>
<td>5.856</td>
<td>1.250</td>
</tr>
<tr>
<td>7. Catalog computers are in good working order.</td>
<td>5.857</td>
<td>1.372</td>
</tr>
<tr>
<td>8. Documents I want are in their proper places on the shelves.</td>
<td>5.826</td>
<td>1.401</td>
</tr>
<tr>
<td>9. The computer catalog is an accurate source of information about all documents held by the library.</td>
<td>5.687</td>
<td>1.384</td>
</tr>
<tr>
<td>10. The range of materials held by the library meets my course needs.</td>
<td>5.687</td>
<td>1.438</td>
</tr>
<tr>
<td>11. Instructions on remote access to the computer catalog are easy to follow.</td>
<td>5.684</td>
<td>1.264</td>
</tr>
<tr>
<td>12. Directional signs in the library are clear, understandable, and helpful.</td>
<td>5.667</td>
<td>1.388</td>
</tr>
<tr>
<td>13. Library materials are shelved promptly after use.</td>
<td>5.664</td>
<td>1.262</td>
</tr>
<tr>
<td>14. The library material I need is in good condition (e.g., not brittle or falling apart).</td>
<td>5.649</td>
<td>1.389</td>
</tr>
<tr>
<td>15. The toilets are clean.</td>
<td>5.644</td>
<td>1.307</td>
</tr>
<tr>
<td>16. Internet, CD-ROM, and database computers are in good working order.</td>
<td>5.621</td>
<td>1.470</td>
</tr>
<tr>
<td>17. The library purchases new materials which are relevant to my course needs.</td>
<td>5.614</td>
<td>1.506</td>
</tr>
<tr>
<td>18. I can usually find a seat or study desk when I want one.</td>
<td>5.611</td>
<td>1.512</td>
</tr>
<tr>
<td>19. I find the temperature in the building is comfortable.</td>
<td>5.603</td>
<td>1.161</td>
</tr>
<tr>
<td>20. Computers for the library catalog are conveniently distributed throughout the library.</td>
<td>5.602</td>
<td>1.359</td>
</tr>
<tr>
<td>21. Library staff give accurate answers to my questions.</td>
<td>5.594</td>
<td>1.354</td>
</tr>
<tr>
<td>22. Library staff are approachable and welcoming.</td>
<td>5.586</td>
<td>1.393</td>
</tr>
<tr>
<td>23. It is easy to find out in advance when the library will be open.</td>
<td>5.571</td>
<td>1.327</td>
</tr>
<tr>
<td>24. I find the ventilation in the building is comfortable.</td>
<td>5.567</td>
<td>1.160</td>
</tr>
<tr>
<td>25. When I connect remotely to the computer catalog I do not get a busy signal or get disconnected.</td>
<td>5.556</td>
<td>1.535</td>
</tr>
<tr>
<td>26. The material I need from the course materials collection is usually available to me when I want it.</td>
<td>5.552</td>
<td>1.480</td>
</tr>
<tr>
<td>27. Library staff are courteous and polite.</td>
<td>5.523</td>
<td>1.384</td>
</tr>
<tr>
<td>28. I feel safe in the building.</td>
<td>5.485</td>
<td>1.797</td>
</tr>
</tbody>
</table>

(Table 1 continued on page 739)
29. Library staff are available when I need them.  5.481  1.368
30. Librarians provide teaching programs
to help me make more effective use of the library.  5.448  1.318
31. Staff communicate with me using
terms I understand.  5.440  1.289
32. I find displays of new materials helpful.  5.437  1.509
33. The computer catalog has a "Help" option
which I understand.  5.436  1.544
34. Hours when the library are open
match my schedule and needs.  5.425  1.533
35. When I enter the library I can see
where I can go for help.  5.400  1.421
36. Library staff are friendly and easy to talk to.  5.388  1.476
37. I find the humidity in the building is comfortable.  5.378  1.309
38. The documents I need have not been mutilated
(e.g., torn pages or highlighted text).  5.364  1.458
39. Photocopiers are in good working order.  5.351  1.431
40. I do not have to wait more than three
minutes when I ask for assistance at a reference desk.  5.343  1.349
41. Library staff offer suggestions where to look for
information in other parts of the library.  5.329  1.429
42. Library furniture is comfortable.  5.321  1.444
43. I do not have to wait more than three
minutes when I use the computer catalogue.  5.296  1.621
44. There is an adequate supply of clean
drinking water in the building.  5.295  1.670
45. The library provides timely, accurate, and
clear information about equipment
not in working order.  5.288  1.422
46. It is easy to make a compliment, complaint, or
suggestions about library services or conditions.  5.286  1.465
47. The library acts promptly when I make a complaint.  5.286  1.318
48. I do not have to wait more than three
minutes when I use the course materials collection.  5.271  1.509
49. Knowledgeable staff are available to assist whenever the library is open.  5.265  1.445
50. There is a sufficient number of toilets in the building.  5.258  1.633
51. When I request an item currently on loan to
another person, I am told how long it will
take to arrive.  5.254  1.611
52. I do not have to wait more than three
minutes when I borrow materials.  5.240  1.488
53. Library staff are willing to leave the desk
area to help me.  5.241  1.488
54. Audio-visual equipment is in good working order.  5.233  1.576
55. Library brochures and help sheets are helpful.  5.227  1.294
56. Library furniture is designed to meet
my practical needs.  5.220  1.464
57. Accurate and helpful written instructions
are available next to all equipment.  5.187  1.441
58. The library has an attractive interior.  5.172  1.396

(Table 1 continued on page 740)
Table 1. continued from page 739

<table>
<thead>
<tr>
<th>Statement</th>
<th>Mean</th>
<th>St Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>59. Library staff encourage me to come back to ask for more assistance if I need it.</td>
<td>5.158</td>
<td>1.546</td>
</tr>
<tr>
<td>60. I do not have to wait more than three minutes when I use Internet, CD-ROM, and database computers.</td>
<td>5.152</td>
<td>1.651</td>
</tr>
<tr>
<td>61. Microfilm and microfiche readers are in good working order.</td>
<td>5.135</td>
<td>1.551</td>
</tr>
<tr>
<td>62. When I request an item from a closed shelf, I am told how long it will take to arrive.</td>
<td>5.134</td>
<td>1.506</td>
</tr>
<tr>
<td>63. When I request an item by interlibrary loan (ILL), I am told how long it will take to arrive.</td>
<td>5.127</td>
<td>1.479</td>
</tr>
<tr>
<td>64. There are an adequate number of lockers in which I can store my personal belongings.</td>
<td>5.108</td>
<td>1.681</td>
</tr>
<tr>
<td>65. Library staff demonstrate and teach the use of the Internet, CD-ROMs, and databases.</td>
<td>5.076</td>
<td>1.470</td>
</tr>
<tr>
<td>66. Library staff understand what information I am looking for.</td>
<td>5.022</td>
<td>1.719</td>
</tr>
<tr>
<td>67. Library staff offer suggestions on where to look for information outside the library.</td>
<td>5.015</td>
<td>1.708</td>
</tr>
<tr>
<td>68. Computer printers are in good working order.</td>
<td>5.015</td>
<td>1.728</td>
</tr>
<tr>
<td>69. Library staff do not refer me unduly from one service area to another for my enquiry to be answered.</td>
<td>5.000</td>
<td>1.291</td>
</tr>
<tr>
<td>70. I do not have to wait more than three minutes when I use photocopiers.</td>
<td>4.963</td>
<td>1.533</td>
</tr>
<tr>
<td>71. Library staff help me select appropriate electronic resources.</td>
<td>4.925</td>
<td>1.540</td>
</tr>
<tr>
<td>72. Library staff mention interlibrary loan as a means to obtain material the library does not have.</td>
<td>4.909</td>
<td>1.637</td>
</tr>
<tr>
<td>73. Library staff personally help me to use electronic resources.</td>
<td>4.873</td>
<td>1.443</td>
</tr>
<tr>
<td>74. I do not have to wait more than three minutes when I phone the library for assistance or information.</td>
<td>4.821</td>
<td>1.608</td>
</tr>
<tr>
<td>75. Library staff direct me to library brochures and help sheets.</td>
<td>4.803</td>
<td>1.490</td>
</tr>
<tr>
<td>76. All public service desks throughout the library are served by knowledgeable staff.</td>
<td>4.800</td>
<td>1.568</td>
</tr>
<tr>
<td>77. Library staff do not overwhelm me with too much information and detail.</td>
<td>4.795</td>
<td>1.562</td>
</tr>
<tr>
<td>78. Library staff demonstrate cultural sensitivity.</td>
<td>4.773</td>
<td>1.541</td>
</tr>
<tr>
<td>79. Library staff show me how to use the computer catalog.</td>
<td>4.770</td>
<td>1.569</td>
</tr>
<tr>
<td>80. There are places for me to use a laptop computer within the building.</td>
<td>4.744</td>
<td>1.820</td>
</tr>
<tr>
<td>81. The library provides services such as staplers, hole punchers, pencil sharpeners, and giving change.</td>
<td>4.733</td>
<td>1.603</td>
</tr>
</tbody>
</table>

(Table 1 continued on page 741)
82. I do not have to wait more than three minutes 
    when I need prints from a computer.          4.658  1.682
83. There is a sufficient number of group study rooms. 4.659  1.830
84. I do not have to wait more than three minutes 
    when I use microfilm and microfiche readers. 4.542  1.656
85. There are study areas where talking is permitted. 4.489  1.963
86. Library staff take me directly to documents I want, 
    instead of just pointing or telling me where to go. 4.378  1.757

will notice the efforts being made to set out collections and services clearly 
and to support the layout with directional signs.

The rankings in Table 1 were then compared with the results from a 
similar survey conducted in New Zealand (Calvert & Hernon, 1997). 
Twenty-two statements were ranked highly (higher than fortieth place) in 
both China and New Zealand (see Table 2). The twenty-two statements 
can easily be reduced to six broad groups:

1. **Study environment**—environment, personal safety, provision of study 
   desks, toilets.
2. **Materials**—matching course needs, accuracy.
3. **Equipment**—maintenance, in good working order.
4. **Organization of materials**—directional signs, OPAC clarity and accuracy.
5. **Services provided**—speed and accuracy of reshelving, notice of opening 
   hours.
6. **Staff attributes**—welcoming behavior.

Recognition of the importance of environmental factors and signage 
echo Bicknell’s (1994) findings for reference services.

All twenty-two statements can be placed into a simple scenario. In this, 
the customer is perhaps already aware that the library’s collection matches 
her needs and that information she will find in the materials is accurate so, 
as she prepares to visit the library, she discovers that it is easy to check that 
the library will be open at a time that suits her. On entering the library, she 
sees the clear directional signs. Sufficient OPAC computers are working, 
and the information on the OPAC is displayed clearly. Using accurate information 
from the OPAC, she then proceeds to find with ease where the 
materials she needs are shelved. The documents have been reshelved quickly 
and accurately so they are available when she needs them. There is a study 
desk readily available, and the library environment (temperature, ventilation, 
and lighting) are all adequate to her needs. Her chosen study area is 
quiet, and she feels safe in the library. When she needs to question staff, 
they are approachable and give her accurate answers. During her visit to 
the library, she finds that the toilets are clean. Her study needs require use 
of an Internet capable computer and a photocopier, so she is pleased to 
find sufficient numbers of them working. As she leaves the library, she may 
well reflect on a way that the library met her expectations of good service.
Table 2. Statements Ranked Highly in China and New Zealand.

<table>
<thead>
<tr>
<th>Statement</th>
<th>China</th>
<th>NZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catalog computers are in good working order</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Directional signs in the library are clear, understandable, and helpful</td>
<td>12</td>
<td>31</td>
</tr>
<tr>
<td>Documents I want are in their proper places on the shelves</td>
<td>8</td>
<td>23</td>
</tr>
<tr>
<td>Hours when the library are open match my schedule and needs</td>
<td>34</td>
<td>12</td>
</tr>
<tr>
<td>I can usually find a seat or study desk when I want one</td>
<td>18</td>
<td>1</td>
</tr>
<tr>
<td>I feel safe in the building</td>
<td>28</td>
<td>20</td>
</tr>
<tr>
<td>I find the temperature in the building is comfortable</td>
<td>19</td>
<td>16</td>
</tr>
<tr>
<td>I find the ventilation in the building is comfortable</td>
<td>24</td>
<td>19</td>
</tr>
<tr>
<td>Information displayed on the computer catalog is clear and easy to follow</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Internet, CD-ROM, and database computers are in good working order</td>
<td>16</td>
<td>17</td>
</tr>
<tr>
<td>It is easy to find out in advance when the library will be open</td>
<td>23</td>
<td>11</td>
</tr>
<tr>
<td>It is easy to find where materials (books, journals, videos, maps, and so on) are shelved.</td>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>Library materials are reshelved promptly after use</td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td>Library staff are approachable and welcoming</td>
<td>22</td>
<td>25</td>
</tr>
<tr>
<td>Library staff give accurate answers to my questions</td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td>Lighting in the building is adequate to my needs</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Photocopiers are in good working order</td>
<td>39</td>
<td>5</td>
</tr>
<tr>
<td>Study areas in the library are kept quiet</td>
<td>5</td>
<td>22</td>
</tr>
<tr>
<td>The computer catalog is an accurate source of information about all documents held by the library</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>The information I get from library materials is accurate</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>The range of materials held by the library meets my course needs</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>The toilets are clean</td>
<td>15</td>
<td>13</td>
</tr>
</tbody>
</table>
The emphasis on self-sufficiency is obvious. Academic library customers prefer to work on their own and value organization and clear signage. Both Chinese and New Zealand students gave a very low ranking to the statement "Library staff take me directly to documents I want, instead of just pointing or telling me where to go." Library staff need not fear this discovery, for who else is it that plans for, and provides, the good organization that customers desire? In a similar example, a customer may enter a wine shop intending to purchase a good Chardonnay from a particular winery. Initially the customer needs to know the opening hours of the shop, and that it is likely to stock the Chardonnay of choice. On arriving at the door, the customer wants good signage to point out the Chardonnay section. The internal environment of the shop should be pleasant and the layout of the shelves and the purchase counter should be clear. Only if the customer discovers that the Chardonnay is not available is she likely to ask shop assistants for help, though she will find it agreeable to meet pleasant and courteous staff. One could pursue this analogy further, but the intention of its provision should be apparent.

If the twenty-two statements are reduced to ones that only appear in the top ten in both countries, five remain:

1. Computer catalogs are in good working order.
2. Information displayed on the computer catalog is clear and easy to follow.
3. Lighting in the building is adequate for the user's needs.
4. The computer catalog is an accurate source of information about all documents held by the library.
5. The information from library materials is accurate.

The library's catalog (or OPAC, if you will) is included in three of the five statements. Perhaps not even the most enthusiastic proponent of library automation would have expected customers to place so much importance on the catalog, but the evidence from this research seems clear.

The Dimensions of Customer Expectations

Academic libraries perform numerous functions for a diverse community, making it difficult for managers to identify key aspects of customer service. This research project alone used eighty-six separate statements, each describing a different aspect of service quality, and this makes it hard for the manager to convert the theory into practical resource allocation decisions. The results of the research are easier to understand once data reduction has simplified the output. Factor analysis attempts to identify underlying factors, or dimensions, that explain the correlations within the variables (statements) that have been used and, further, researchers can describe what the factors represent conceptually. This tool has successfully been used to identify the dimensions of academic library
effectiveness (McDonald & Micikas, 1994), and here it is applied to the similar but different topic of service quality.

Not all the factors display interpretable results. Factor 1 of the Chinese survey is clear and shows considerable similarity to the New Zealand factor 1. Many of the statements here are also in Table 2, meaning that customers have high expectations of these aspects of library service. Significantly, many are about services provided by the library as mediation between customer and collections, though often with no direct personal communication. The range of this factor is about customer self-service and the materials being readily available for use. The most similar dimension in SERVQUAL is “reliability.” The highest loading statement in the China survey is “Information displayed on the computer catalogue is clear and easy to follow.” Remarkably, once two statements not used in China are deleted, exactly the same statement is the highest loading variable in New Zealand factor 1, so this once again emphasizes the centrality of the OPAC to good service quality. Factor 2 is something of a farrago but has some similarities to New Zealand’s sixth factor. Even though there is not much coherence in the statements, the repetition between the two surveys is worth noting.

Chinese factors 3 and 4 are both about staff attributes. If any difference can be discerned, it lies in the higher expectations (from Table 1) given to the statements in factor 3, which also coincides with much of the New Zealand factor 4. Put another way, the miscellany of statements in China factor 4 should not be considered as important, though it looks similar to New Zealand’s third factor. The highest loading variable in China factor 3 is “Library staff are courteous and polite,” and this statement loads second in New Zealand factor 4. Factor 6 contains several statements that are important, such as safety, photocopier maintenance, clean toilets, and good lighting. Several are about the library environment, and perhaps it shows that, to library customers, some equipment—e.g., photocopiers—equates with furniture and lighting and is part and parcel of the library environment. The elements similar to SERVQUAL dimensions are “assurance” and “empathy.”

Of the other smaller factors, number 8 includes important statements about signage and knowing opening hours in advance. Factor 10 includes the statements on reshelving materials promptly and having materials in good condition. Factor 13 has two broad statements that correlate well, about having opening hours that match customer needs and good organization that aids customers to find the materials they want.

Findings on Expectations

The surveys conducted in New Zealand and China have shown that customers in two apparently diverse countries display many similarities in their expectations of service quality. The focus is on inter mediation largely
without personal contact, making the library and its services readily avail-
able when the customer wants them, and offering a collection in good order that matches the customer's needs. Perhaps of more importance is that neither the library staff focus groups nor the survey of university students produced any results that were significantly different to similar research held in New Zealand. The similarities between the two move somewhat toward satisfying the call for more knowledge of global dimensions of library service quality. It also satisfies the need for normative results in customer expectations research.

Objectives of the Secondary Project

Here is also included a report from a secondary project that served the following purpose: to test if underlying attitudes to service quality among LIS students are similar in different cultures.

The Attitudinal Survey

One possible explanation of attitudes to service quality and, therefore, part of the formation of expectations, might be the national origins of the respondents. Service quality is itself such an intangible and emotional concept that it is reasonable to point at national cultures as a source of these subjective attitudes. If national culture plays a part in forming attitudes to service quality, then, first, the goal of a global set of academic library service quality expectations may be too hard to attain and, second, managers will need to adapt customer service training methods to suit national variations. As a way of testing the impact of national culture, a survey was conducted that examined basic attitudes toward service quality among library and information studies (LIS) students at Peking University in China and Victoria University of Wellington in New Zealand. The instrument used was based heavily on the four dimensions of national culture developed by Hofstede (1997) that has been widely accepted in the disciplines of cross-cultural psychology and ethnography. Despite its apparent suitability for this kind of international study, Hofstede's work does not seem to have been used before in LIS. One reason for supposing that there would be differences in attitudes to service quality is that China is still influenced by Confucianism (though some might argue that this influence is declining), and Confucian philosophy considers human relationships as the basis of all human society. New Zealand, by contrast, is a more egalitarian, individualistic culture.

Hofstede's four dimensions and their implications for library service quality are as follows. Attitudes measured according to the power distance (PD) dimension deal with the way a society handles inequality. The more that a society accepts the idea that power is to be distributed unequally, the higher its PD. The PD dimension also includes the emotional distance that separates subordinates from their bosses and, in a high PD culture, it
is common for bosses to have an autocratic or paternalistic style at the head of an organization with a highly vertical structure. Employees will be afraid to express disagreement with their managers and, indeed, if a manager asks for advice from employees, it may be taken as a sign of weakness. A low PD culture is more egalitarian, and organizations are likely to be vertically flat. “In a collectivist culture, while a high-status person can challenge the position or opinion of a low-status person, it is a norm-violation for a low-status person to directly rebut or question the position or the opinion of the high-status person, especially in the public arena” (Ting-Toomey, 1997, p. 399).

In contrast to the “rugged individualism” fostered in the west and popular in American legend, the view of “self” cultivated in the east and strengthened by its dominant philosophies is that of a person embedded within an unchanging social order. Identity is acquired from membership in groups, so the sense of self that emerges is not the western “existential ego” but a “social ego.” It is not self-sufficiency and the good of the self that is fostered, it is the collective good of the in-group. Hofstede labeled this as individualism and collectivism (IND), in which: “Individualism pertains to societies in which the ties between individuals are loose: everyone is expected to look after himself or herself and his or her immediate family. Collectivism as its opposite pertains to societies in which people from birth onwards are integrated into strong, cohesive in groups, which throughout people’s lifetime continue to protect them in exchange for unquestioning loyalty” (Hofstede, 1997, p. 51). Application of this dimension to library service quality should see a contrast, on the one hand, between the collectivist concern for nurturing relationships with customers and the avoidance of conflict and, on the other hand, the individualists whose interests lie in personal gain. It will pose particular problems at the reference interview and at all other times when customers need to communicate their information needs or other desires to library staff. In the context of an Asian customer asking a western librarian for assistance, the staff member may be bemused by the unwillingness, which will seem as an inability, to express needs specifically.

The uncertainty avoidance (UA) dimension refers to the way that people within a culture deal with uncertainty. Those high in UA feel threatened by ambiguous situations and so like to have rules and set procedures to guide them. Those low in UA can tolerate ambiguity and actually prefer to be left with flexibility in how they respond to any given situation. Confucian thought says that it is the responsibility of the manager to lead employees to a perfect working environment. “A manager has to inform employees clearly about the goal of and behavioral criteria in the company” (Chen & Chung, 1997, p. 323), meaning library staff will expect clear customer service guidelines from their managers and will not wish to deviate from them. By contrast, individuals in a low UA culture will
always look for innovative new ways to improve customer service, and providing good service is part of the challenge and enjoyment of working.

Rather confusingly, masculinity/femininity (MAS) does not refer to gender roles but the degree to which a society focuses on assertiveness and the acquisition of things, as opposed to societies that give value to quality of life issues, such as caring for others. High MAS cultures endorse aggressive behavior that results in success, such as promotion at work, so assertiveness and competitiveness are accepted as sensible behavior. The challenge of good customer service as a career move is willingly accepted by those high in MAS. The opposite culture in this dimension is one that values caring, compromise and cooperation, the nurturing of relationships, and modesty.

Comments on the Four Dimensions

In an attitudinal study of 9,000 male commercial pilots, Merritt followed Hofstede’s cross-cultural study with the intention of replicating all four dimensions. The dimensions of Power Distance and Individualism-Collectivism were replicated successfully. The report’s author considers that the nature of the profession may account for this, “partly because they are at the forefront of their cultures with regard to technology and global communications, but also because of their self-selection into a very individualistic profession.” Merritt then attempted to correlate the UA dimension with attitudes to automation and discovered that those cultures whose members endorse rules and procedures as a way of resolving uncertainty also endorse the use of automation, perhaps because the computer takes over decision-making and offers the “correct” solution to a problem. Pilots can be drawn to automation for two reasons, he postulates. Those pilots with low PD and low UA regard the machine as a challenge to be used and conquered. Those with high PD and high UA accept the “expert” role of automation and appreciate the security it brings. It could well be that the nature of a profession or a career that displays an inherent need for a particular type of personality may succeed in attracting just that kind of individual to its ranks. If this is true for the library profession, then it will attract people high in collectivism, probably low in masculinity, and perhaps high in uncertainty avoidance (though not consistently so). Librarians may be different in PD according to the cultures of library organizations in their own countries.

The Survey Instrument

The researcher developed sixteen statements describing attitudes to service quality that drew heavily upon Hofstede’s work (see Appendix B). In order to ensure that respondents in both countries understood the statements equally well, it was essential that the survey instrument be written in both English and Chinese languages, and that the intention of the statements be the same in both languages. The first version of the survey
instrument was written in English. Commonly, back-translation has been used to create the second version—that is, the original version is translated into the target language then a second translator takes that version and translates it back into the original language. The investigator then checks with both translators for inconsistencies. An alternative way of producing survey instruments in two languages is the method of decentering—a method that considers both languages equally important in the design of the instrument. This uses "continuous revision in which the original draft version changes as the translation process attempts to account for lack of verbal equivalence in the target language" (Metoyer-Duran, 1993, p. 23). For this survey, the method used was closest to back-translation, but statements in the original version were rewritten into a completely different form when translation into Chinese proved cumbersome from the original. In that respect, decentering was used when difficulties were encountered.

Researchers involved with any culture other than their own should beware of monocultural assumptions. This research project, however, was actually looking for different cultural attitudes rather than trying to justify the researcher's own assumptions. Using statements rather than questions in the survey instrument, with the only requirement being that the respondent "rated" them on a Likert scale, avoided the potential pitfall of Asian respondents inaccurately answering "yes" to closed questions in order to avoid the impoliteness of a negative answer (Metoyer-Duran, 1993, p. 23).

Analysis

Responses from all Chinese students (n = 58) were cross-tabulated with responses from all New Zealand students (n = 59) (see Table 3). Only one statement showed any strong difference in attitudes: "I do not expect my manager to serve customers because they have the privilege of choosing not to do so." The Chinese were much more likely to agree with this statement than their New Zealand peers. This underscores the belief that cultures high in PD give deference/respect to those of a higher status. Implications for service quality are that managers may decide not to work on service desks, leaving the work to junior staff, and that junior staff will be very reluctant to question decisions made by their superiors even if it leads to reduced service quality. Interestingly, the statement with the next highest difference between countries is "I need training for customer service from my managers to give me the skills and abilities to do the job properly" which emphasizes a strong underlying variation in national cultural attitudes when librarians consider their relationships with managerial superiors. Another implication is that any customer service training of staff in countries high in PD must take into account the very influential position of senior managers. It comes as no surprise, perhaps, that the
third highest difference (MAS2) also involves attitudes toward management. There could be a strong message here about internal communication (Gap 1 in the SERVQUAL model), though the evidence does not point to the Chinese or western approaches as being superior.


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<th>Likelihood ratio</th>
<th>df</th>
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<tr>
<td>PD1</td>
<td>3.521</td>
<td>8</td>
<td>.898</td>
</tr>
<tr>
<td>PD2</td>
<td>119.478</td>
<td>8</td>
<td>.000</td>
</tr>
<tr>
<td>PD3</td>
<td>21.378</td>
<td>8</td>
<td>.006</td>
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<tr>
<td>PD4</td>
<td>11.167</td>
<td>8</td>
<td>.192</td>
</tr>
<tr>
<td>IND1</td>
<td>7.195</td>
<td>8</td>
<td>.516</td>
</tr>
<tr>
<td>IND2</td>
<td>36.607</td>
<td>8</td>
<td>.000</td>
</tr>
<tr>
<td>IND3</td>
<td>14.410</td>
<td>8</td>
<td>.072</td>
</tr>
<tr>
<td>IND4</td>
<td>25.824</td>
<td>8</td>
<td>.001</td>
</tr>
<tr>
<td>MAS1</td>
<td>16.547</td>
<td>8</td>
<td>.035</td>
</tr>
<tr>
<td>MAS2</td>
<td>29.382</td>
<td>8</td>
<td>.000</td>
</tr>
<tr>
<td>MAS3</td>
<td>4.001</td>
<td>6</td>
<td>.677</td>
</tr>
<tr>
<td>MAS4</td>
<td>5.085</td>
<td>6</td>
<td>.533</td>
</tr>
<tr>
<td>UA1</td>
<td>10.057</td>
<td>8</td>
<td>.261</td>
</tr>
<tr>
<td>UA2</td>
<td>3.475</td>
<td>6</td>
<td>.747</td>
</tr>
<tr>
<td>UA3</td>
<td>7.404</td>
<td>8</td>
<td>.494</td>
</tr>
<tr>
<td>UA4</td>
<td>11.905</td>
<td>8</td>
<td>.155</td>
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No one dimension shows complete unity, although the PD dimension shows some differences between the two country responses. The uncertainty avoidance dimension shows almost no significant difference between countries (Merritt’s study, mentioned earlier, throws doubt upon the validity of the UA dimension). Thus there is no evidence that strong national cultural differences are showing through and that it is necessary to reject the belief that national cultural differences have strongly influenced attitudes to library service quality among LIS students. There is no reason to suppose that national culture is a major element in the formation of service quality expectations, certainly not a more significant factor than previous experience of a service.

Just as Merritt explained the high IND scores for pilots as a result of the profession’s very nature, so the low variation on the IND dimension between librarians in China and New Zealand may be accounted for by two explanations. First, library staff everywhere deal with “strangers” for much of the time, and there is a point beyond which the sense of collective good ceases to influence behavior. Second, Hofstede dealt only with national cultures as generalities and never claimed that all people in one
nation would behave the same way, so naturally New Zealand will have a proportion of people with a higher sympathy for collectivism than for individualism, although the majority may be individualists. It is possible that librarianship, by its very nature, attracts those with a collectivist mentality, for “loaning, borrowing, and giving are all ways of building or maintaining a social network of reciprocation; collectivists would go to great lengths to maintain social relationships by this means” (Hui & Triandis, 1986, p. 229). Collectivists also have a strong feeling of involvement in the lives of others to the extent that others’ experiences could have direct or indirect consequences for themselves.

Problems

Perhaps this research attempted a “bridge too far.” Hofstede’s work has not previously been applied to LIS so perhaps it would be a more reliable starting point to assess librarians in general on the Hofstede dimensions rather than changing the statements to measure attitudes to service quality. Factor analysis did not show the four dimensions emerging from the responses, which may mean that the statements were not an accurate reflection of Hofstede’s intentions though, as has been pointed out earlier, there are already critics who doubt the strength of some of his dimensions.

Hofstede’s work has gained widespread acceptance in cross-cultural psychology, but it is not without its critics. A group calling themselves the Chinese Culture Connection (1987) constructed a rather different survey to Hofstede’s, one that attempted to avoid the limitations of a western viewpoint being used to analyze cultural psychological processes that did not share the same origins. By creating an artefact based entirely on Chinese values, the authors searched for dimensions reflective of Chinese culture only. They created four new dimensions; three of them showed similarities with Hofstede’s PD, IND, and MAS but none with UA. They labeled the new dimension “Confucian work dynamism.” Interestingly, librarians in the Chinese focus groups were eager to mention “trying hard” as the most important element of good customer service. No matter how hard the problem, they said, do your best to provide each individual customer with what he/she wants. This could be evidence of Confucian work dynamism.

Conclusion

It has become increasingly clear, following research in the United States, New Zealand, Singapore, and the People’s Republic of China, that academic library customers have very similar expectations of service. The three most common dimensions revealed so far concern staff attitudes, the library environment, and services that help the customer to find and use the library’s materials efficiently. The case study approach has revealed
much the same results in four countries, so there is probably no need to take this research method any further. A secondary survey of LIS students in China and New Zealand showed strong similarities in attitudes toward service quality, though variations appeared in deference to management among Chinese students that was not shared by their New Zealand peers.

Although further research could test the strength of the “Confucian work dynamism” dimension, research so far supports a belief that individuals select their careers according to personality types, and that librarianship attracts people with similar attitudes to service quality. National culture does not seem to be a major precursor of service quality attitudes. The two projects together give strong support to the use of internationally accepted measures of academic library service quality.

ACKNOWLEDGMENT

This research was conducted while on an academic exchange program with Peking University in the People’s Republic of China, and I wish to give my thanks to colleagues in the University Library and the Department of Library and Information Science, without whom my visit would not have been nearly so pleasant or fruitful.
APPENDIX A
Thirteen Factors Emerging from a Survey of Expectations in Two Chinese University Libraries

Factor 1
Information displayed on the computer catalogue is clear and easy to follow.
The material I need from the course materials collection is usually available to me when I want it.
Instructions on remote access to the computer catalogue are easy to follow.
The range of materials held by the library meets my course needs.
The information I get from library materials is accurate.
Documents I want are in their proper places on the shelves.
The library's Web pages contain correct and useful information about library services and materials.
The computer catalogue is an accurate source of information about all documents held by the library.
Computers for the library catalogue are conveniently distributed throughout the library.
The library purchases new materials which are relevant to my course needs.
Internet, CD-ROM and database computers are in good working order.
The documents I need have not been mutilated (e.g., torn pages or highlighted text).
I do not have to wait more then three minutes when I use the computer catalogue.

Factor 2
When I request an item currently on loan to another person, I am told how long it will take to arrive.
When I request an item by Interlibrary loan, I am told how long it will take to arrive.
The computer catalogue has a "Help" option which I understand.
When I request an item from a closed shelf, I am told how long it will take to arrive.
There is an adequate supply of clean drinking water in the building.
When I connect remotely to the computer catalogue, I do not get a busy signal or get disconnected.
When I enter the library I can see where I can go for help.
Library staff mention Interlibrary loan as a means to obtain material the library does not have.
Catalogue computers are in good working order.
Library staff offer suggestions on where to look for information in other parts of the library.
Library staff offer suggestions on where to look for information outside the library.
Computer printers are in good working order.

Factor 3
Library staff are courteous and polite
Library staff are willing to leave the desk area to help me.
Library staff are approachable and welcoming; are friendly and easy to talk to.
Library staff encourage me to come back to ask for more assistance if I need it.
Library staff are approachable and welcoming.
Library staff do not overwhelm me with too much information and detail.
Library staff are available when I need them.
Library staff understand what information I am looking for.

Factor 4
Library staff show me how to use the computer catalog.
Library staff take me directly to documents I want, instead of just pointing or telling me where to go.
Library staff personally help me to use electronic resources.
Library staff demonstrate cultural sensitivity.
Library staff direct me to library brochures and helpsheets.
Library staff do not overwhelm me with too much information and detail.
Library staff help me select appropriate electronic resources.

Factor 5
It is easy to make a compliment, complaint, or suggestions about the library services or conditions.
I do not have to wait more then three minutes when I use the course materials collection.
Audiovisual equipment is in good working order.
The library provides timely, accurate, and clear information about equipment not in working order.
The library provides services such as staplers, hole punchers, pencil sharpeners, and giving change.
I do not have to wait more then three minutes when I use Internet, CD-ROM, and database computers
Microfilm and microfiche readers are in good working order.
Factor 6

Library furniture is comfortable.
I feel safe in the building.
Photocopiers are in good working order.
The toilets are clean.
Staff communicate with me using terms I understand.
There is a sufficient number of toilets in the building.
Lighting in the building is adequate to my needs.

Factor 7

I do not have to wait more than three minutes when I phone the library for assistance or information.
I do not have to wait more than three minutes when I use microfilm and microfiche readers.
I do not have to wait more than three minutes when I use photocopiers.
I do not have to wait more than three minutes when I need prints from a computer.

Factor 8

Directional signs in the library are clear, understandable, and helpful.
It is easy to find out in advance when the library will be open.
All public service desks throughout the library are served by knowledgeable staff.
Library furniture is designed to meet my practical needs.

Factor 9

Librarians provide teaching programs to help me make more effective use of the library.
Library brochures and helpsheets are helpful.
Knowledgeable staff are available to assist whenever the library is open.
I find the ventilation in the building is comfortable.
Library staff demonstrate and teach the use of the Internet, CD-ROMs, and databases.
I find the temperature in the building is comfortable.
I find displays of new materials helpful.

Factor 10

Library materials are reshelved promptly after use.
The library acts promptly when I make a complaint.
The library material I need is in good condition (e.g., not brittle or falling apart).
Factor 11
There are study areas where talking is permitted.
I find the humidity in the building is comfortable.

Factor 12
I do not have to wait more then three minutes when I borrow materials.
I do not have to wait more then three minutes when I ask for assistance at
a reference desk.

Factor 13
Hours when the library are open match my schedule and needs.
It is easy to find where materials (books, journals, videos, maps, etc.) are
shelved.
**APPENDIX B.**
Sixteen statements on attitudes to library service quality.

**PD1** My manager will tell me how to serve a customer and I should listen to him/her to do a good job.

**PD2** I do not expect my manager to serve customers because they have the privilege of choosing not to do so.

**PD3** All the library staff should join together to set management objectives for good customer service.

**PD4** It is good to make decisions about customer service at the local level and not be told what to do by a central authority.

**IND1** Customer service is done best when I adopt my own approach to the job.

**IND2** I need training for customer service from my managers to give me the skills and abilities to do the job properly.

**IND3** I would prefer to say that I can’t answer a question rather than give a customer information that may not be accurate.

**IND4** It is right to deal with all customers equally in all situations, even though I do not know them personally.

**MAS1** If a customer argues with me then I will do everything I can to resolve the conflict by compromise and negotiation.

**MAS2** I want to serve customers well because that way management will recognize my ability and so I will rise in status.

**MAS3** Providing good customer service is a challenging part of my job, and it is by doing challenging work that I get the greatest personal satisfaction.

**MAS4** One of the key skills I need for good service is looking after my relationships with customers.

**UA1** I want a full set of written rules that tell me how to serve a customer.

**UA2** When I deal with customers I am always looking for new ways to improve the service.

**UA3** My managers have learned broad general principles for good customer service and they will help me apply them to my customers.

**UA4** All my customers are different and that makes every day different and I enjoy that.
REFERENCES


Measuring Service Quality in the Networked Environment: Approaches and Considerations

JOHN CARLO BERTOT

ABSTRACT
The networked environment offers libraries challenges and opportunities in a number of areas including management, service provision, and collection development. A particular challenge that libraries face in the networked environment is that of measuring and evaluating network-based services. This article offers a number of statistics and performance measures that libraries may find useful in determining the overall quality of their network-based services; identifies a number of service quality criteria; and provides a framework to assist librarians in selecting statistics and performance measures based on service quality criteria. The statistics and performance measures, criteria, and framework are the result of a number of current and past research projects conducted by the author and others across library types.

INTRODUCTION
The development of library networked statistics and performance measures is an important undertaking that is receiving increased attention and support. There is a great need for statistics and performance measures that:

- assist libraries to make a strong case for support for a technology and information infrastructure by documenting their Internet-based services and resources;

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• allow libraries to effectively compare themselves to others in terms of Internet development, costs, provision of services, connectivity, and use;
• enable library directors and administrative library agencies to compete for resources with other organizations and/or departments by documenting the range, extent, and impact of library-provided networked services;
• facilitate the transition from traditional library use measures such as circulation, reference transactions, interlibrary loans, and so on, to network measures that describe the nature and use of library-based network activities and resources;
• provide a decision-making framework for library staff, managers, and administrators to determine resource allocation strategies and meet other management needs; and
• provide the means to measure the quality of library services and resources in the networked environment.

These and other factors point to the overall importance for research that generates library network statistics and performance measures.

**Methodology**

This article draws upon findings from a number of research efforts:

• Institute of Museum and Library Services National Leadership Grant to develop national public library network statistics and performance measures (January 1999-August 2000). The study used a multi-method approach to the development of national network statistics and performance measures (see Figure 1). The data-collection efforts encompassed a variety of data-collection activities that involve library researchers, practitioners, policy makers, state library agencies, database vendors, and public library administrators and staff. In particular, the study team worked with six states throughout the data-collection process (Delaware, Maryland, Michigan, North Carolina, Pennsylvania, and Utah) to develop, test, and finalize the network statistics and performance measures (see Figures 2 and 3). Additional study findings, statistics, and performance measure collection, management, and evaluation techniques are available in Bertot, McClure, and Ryan (2001).

• Evaluating the statewide electronic networks of the state libraries of Delaware (DelWARE, http://www.lib.de.us/) and Maryland (Sailor, http://www.sailor.lib.md.us/), as well as the state library of California’s InFoPeople project (http://www.infopeople.org/) (1996-1999). The Sailor and DelWARE evaluation projects focused on assessing and measuring the networked environment for statewide networks, while the InFoPeople evaluation project centered on the
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<th>Technique</th>
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<td>Case Sites</td>
<td>In-depth exploration of selected communities and target audiences in those</td>
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<td>communities, use of, and involvement with, the network. Use findings to inform</td>
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<td>broader quantitative data-collection activities such as mail and electronic</td>
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<td>surveys.</td>
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<td>Content Analysis</td>
<td>Gather various documentation and reports to review historical development,</td>
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<td>evolution of network-related activities, and future directions.</td>
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<td>Critical Path Analysis</td>
<td>In-depth exploration of user-based interactions with project-related components</td>
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<td>(e.g., training, workstation use, and searching). Use findings to uncover specific</td>
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<td>instance issues. Particularly appropriate for in-depth analysis of training and</td>
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<td>use issues.</td>
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<td>Focus Groups</td>
<td>Explore identified key issue areas of network content, services, management, and</td>
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<td>performance. Use findings to inform broader quantitative data-collection activities</td>
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<td>such as mail and electronic surveys.</td>
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<td>Policy Analysis</td>
<td>Systematic review of policy instruments (e.g., legislation, regulations, standard</td>
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<td>operating procedures, governance documents) to assess scope, formation,</td>
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<td>implementation, execution, and impact of network policies. Use findings to</td>
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<td>develop context of network activities, identify key governance issues, and develop</td>
</tr>
<tr>
<td></td>
<td>recommendations for future network policy development.</td>
</tr>
<tr>
<td>Small Group and Individual</td>
<td>In-depth exploration of network content, services, management, and performance</td>
</tr>
<tr>
<td>Interviews</td>
<td>with key project administrators and users. Assess the relationship between</td>
</tr>
<tr>
<td></td>
<td>components of the network and future educational use and development of network</td>
</tr>
<tr>
<td></td>
<td>resources. Use findings to inform broader quantitative data-collection activities</td>
</tr>
<tr>
<td></td>
<td>such as mail and electronic surveys.</td>
</tr>
</tbody>
</table>

Figure 1. Methodologies for Measuring Electronic Networked Services.
<table>
<thead>
<tr>
<th>Technique</th>
<th>Function/Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mail/Electronic Surveys</td>
<td>Further explore identified key issue areas of network content, services, management, and performance with broader project population. Test findings from qualitative data-collection activities with broader network population.</td>
</tr>
<tr>
<td>Pop-up Surveys</td>
<td>Web-based surveys triggered by access to a particular portion of a Web site. Focused exploration of section of Web site.</td>
</tr>
<tr>
<td>Network Traffic Measures</td>
<td>Collect network/terminal traffic use statistics such as users, user access points, information and service content use, and network server and router load. Provides sense of network load, capacity, and what services are used and with what frequency.</td>
</tr>
<tr>
<td>Web Log File Analysis</td>
<td>Measure Web-based services by the analysis of Web server log files. Provides sense of users and locations which access the services, server traffic, type of technology users have, and errors encountered.</td>
</tr>
</tbody>
</table>

Figure 1. Methodologies for Measuring Electronic Networked Services.
<table>
<thead>
<tr>
<th>Network Statistic</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Public Access Workstations</strong></td>
<td></td>
</tr>
<tr>
<td>Number of public access workstations</td>
<td>Annual count of the number of library-owned public access graphical workstations that connect to the Internet for a dedicated purpose (to access an OPAC or specific database) or multiple purposes.</td>
</tr>
<tr>
<td>Number of public access workstation users</td>
<td>Annual count of the number of users of all library graphical public access workstations connected to the Internet computed from a one-week sample.</td>
</tr>
<tr>
<td>Maximum speed of public access Internet workstations</td>
<td>Indication of the maximum bandwidth of public Internet access, e.g., less than 56kbps, 56kbps, 128kbps, 1.5mbps, etc.</td>
</tr>
<tr>
<td><strong>Databases</strong></td>
<td></td>
</tr>
<tr>
<td>Number of full-text titles available by subscription</td>
<td>Count of the number of full-text titles that the library subscribes and offers to the public computed one time annually.</td>
</tr>
<tr>
<td>Report: Serial titles, Other titles, Total titles</td>
<td></td>
</tr>
<tr>
<td>Number of database sessions</td>
<td>Total count of the number of sessions (logins) initiated to the online databases. Definition adapted from proposed ICOLC standard <a href="http://www.library.yale.edu/consortia/webstats.html">http://www.library.yale.edu/consortia/webstats.html</a></td>
</tr>
<tr>
<td>Number of database queries/searches</td>
<td>Total count of the number of searches conducted in the library’s online databases. Subsequent activities by users (e.g., browsing, printing) are not considered part of the search process. Definition adapted from proposed ICOLC standard <a href="http://www.library.yale.edu/consortia/webstats.html">http://www.library.yale.edu/consortia/webstats.html</a></td>
</tr>
<tr>
<td>Number of items examined using subscription services</td>
<td>Count the number of views to each entire host to which the library subscribes. A view is defined as the number of full text articles/pages, abstracts, citations, and text only, text/graphics viewed. Definition adapted from proposed ICOLC standard <a href="http://www.library.yale.edu/consortia/webstats.html">http://www.library.yale.edu/consortia/webstats.html</a></td>
</tr>
</tbody>
</table>

Figure 2. Public Library Network Resources and Services Statistics * (Continued on p. 763).*
<table>
<thead>
<tr>
<th>Network Statistic</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electronic Services</strong></td>
<td>Annual count of the number of reference transactions using the Internet. A transaction must include a question received electronically (e.g., via e-mail, WWW form, etc.) and responded to electronically (e.g., e-mail).</td>
</tr>
<tr>
<td>Public service time spent servicing information technology Report: Information technology staff, Paid public service staff (Professional Librarian, Para-professional), Volunteer, &amp; Total</td>
<td>Annual count of the staff hours spent in servicing information technology resource and service activity in public service areas computed based on a one-week sample.</td>
</tr>
<tr>
<td><strong>Virtual Visits</strong></td>
<td>Count of visits to the library via the Internet. A visit occurs when an external user connects to a networked library resource for any length of time or purpose (regardless of the number of pages or elements viewed). Examples of a networked library resource include a library OPAC or a library Web page. In the case of a user visit to a library Web site, a user who looks at 16 pages and 54 graphic images registers one visit on the Web server.</td>
</tr>
<tr>
<td><strong>Instruction</strong></td>
<td>A count of the number of users instructed and the hours of instruction offered in the use of information technology or resources obtainable using information technology in structured, informal, and electronically delivered instruction sessions conducted or sponsored by the library.</td>
</tr>
<tr>
<td>Staff information technology instruction Report: Number of staff instructed, Number of hours of staff instruction</td>
<td>Annual count of the total number of staff instructed and the number of hours of formal instruction in the management or use of information technology or resources obtainable using IT.</td>
</tr>
</tbody>
</table>

Figure 2. Public Library Network Resources and Services Statistics.
<table>
<thead>
<tr>
<th>Public access Internet workstations in proportion to the legal service area population</th>
<th>The ratio of the legal service area population to the number of public access Internet workstations.  E.g., XYZ library provides 1 public access Internet workstation per 3,000 legal service population.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average annual use per public access Internet workstation</td>
<td>The ratio of the number of public access Internet workstation users to the number of public access Internet workstations.</td>
</tr>
<tr>
<td>Total reference activity</td>
<td>Combine traditional measures of reference service with electronic measures.</td>
</tr>
<tr>
<td>Percentage of virtual reference to total reference questions</td>
<td>Percentage of the number of virtual reference transactions to total reference questions (both traditional and virtual).</td>
</tr>
<tr>
<td>User information technology instruction as percentage of total reference activity</td>
<td>The number of users instructed in information technology as a percent of total reference activity.</td>
</tr>
<tr>
<td>Level of paid public service effort in servicing information technology</td>
<td>Percentage of paid public service staff time spent serving the public that is spent servicing information technology during a sample period.</td>
</tr>
<tr>
<td>Total library materials use</td>
<td>This composite measure combines the circulation and use figures for all of the paper; multimedia, and electronic collections that the public library owns or provides access to.</td>
</tr>
<tr>
<td>Percentage of electronic materials use of total library materials use</td>
<td>Compares electronic materials use in the form of the number of items examined using subscription services with the total library materials use.</td>
</tr>
<tr>
<td>Total number of serial titles offered</td>
<td>Count of paper based serials titles added to the number of full-text serial titles available by subscription.</td>
</tr>
<tr>
<td>Percentage of serial titles offered in electronic form</td>
<td>Compares the number of unique electronic full-text serial titles available by subscription to the total number of serial titles offered.</td>
</tr>
<tr>
<td>Total library visits</td>
<td>Physical attendance at the library and the number of virtual visits combined into one total.</td>
</tr>
<tr>
<td>Percentage of remote library visits</td>
<td>The percent of virtual visits to total library visits (virtual plus physical library visits).</td>
</tr>
<tr>
<td>Percentage of legal service area population receiving information technology instruction</td>
<td>The percentage of the legal service area population receiving information technology instruction annually from the public library.</td>
</tr>
<tr>
<td>Hours of formal information technology instruction per staff member</td>
<td>The average number of hours of formal information technology instruction a public library staff member receives per year.</td>
</tr>
<tr>
<td>Number of users of electronic resources and services</td>
<td>This composite figure adds the number of virtual visits to networked library resources, the number of users instructed in information technology and the number of virtual reference transactions.</td>
</tr>
</tbody>
</table>

Figure 3. Public Library Network Composite and Performance Measures.
impact of Internet connectivity on public libraries (Bertot, McClure, & Ryan, 1999; Bertot & McClure, 1996, 1999a).

- National studies assessing public library involvement with, and use of, the Internet conducted between 1994 and 2000. These studies focused on public library-based Internet and technology infrastructure, issues, and use (Bertot & McClure, 1999b, 2000).

- In-progress research sponsored by the Association of Research Libraries (ARL) to develop network statistics and performance measures for academic libraries (see http://www.arl.org/stats/newmeas/emetrics/index.html).

Together, these studies provide substantial findings that inform the network statistics and performance measures and quality measurement framework presented in this article.

The types of data-collection techniques used in the above mentioned studies included:

- case studies/site visits to various libraries, state library agencies, and other appropriate organizations;
- interviews and focus groups with key stakeholders in libraries, state and local government, library professional organization staff members and relevant working committees, state library data coordinators, and others; and
- national and statewide mail and Web-based surveys.

The methods were used generally in some combination and employed an iterative learning strategy in which the data-collection activities were sequenced so that the findings from one data-collection event were incorporated into subsequent data-collection activities. This technique of iterative learning allowed for the refinement, modification, and adaptation of data-collection approaches as the studies progressed.

The study teams involved in the various research efforts engaged in a number of activities to ensure reliable and valid findings as described in Krueger (1994), Creswell (1994), and Babbie (1997). Additional information on the methodologies for each study is available in the study reports.

DEVELOPING A MODEL FOR MEASURING SERVICE QUALITY IN THE NETWORKED ENVIRONMENT

There are a number of approaches in developing a quality measurement framework for networked library services and resources. Thus, while this article presents one quality framework, others are possible. Indeed, Bertot et al. (2000) identify at least four models for determining library network statistics and performance measures:

1. Audience Model, in which the consumer of the network data is the primary lens for developing network statistics and measures;
2. Technology Infrastructure Model, in which the existing information technology (IT) architecture and/or equipment drives the types of statistics and measures in which a library is most interested and finds most useful;

3. Network Component Model, in which various network service and resource dimensions are measured along a number of service quality indicators; and

4. Composite Model, in which aspects of the various models are incorporated into a service quality approach.

Each model presents a different lens for developing statistics and performance measures and has both strengths and weaknesses. The Network Component Model, however, offers a more robust approach to developing network statistics and performance measures as well as providing a service quality framework.

The Network Component Model

As first described by Bertot and McClure (1998), this model provides a two-dimensional framework for the development of electronic statistics and performance measures (see Figure 4). The model suggests that there are numerous components to electronic measures:

• *Technical infrastructure.* The hardware, software, equipment, communication lines, and technical aspects of the network (e.g., workstations, modems, servers).

• *Information content.* The information resources available on the network (e.g., local government information, special collections).

• *Information services.* The activities in which users can engage and the services that users may employ to complete various tasks (e.g., EbscoHost, UnCover, online applications).

• *Support.* The assistance and support services provided to help users to benefit from the network (e.g., training, help desk).

• *Management.* The human resources, governance, planning, and fiscal aspects of the network (e.g., network staff, advisory boards, budgeting).

In addition, there are different types of evaluation criteria that are used to describe library Internet-based use and services:

• *Extensiveness.* How much of a service the network provides (e.g., number of users accessing a Web page per week, number of database sessions);

• *Efficiency.* The use of resources in providing or accessing networked information services (e.g., cost per session in providing access to remote users of an online database, average number of times users are unable to successfully connect to the library's servers);
• **Effectiveness.** How well the networked information service met the objectives of the provider or the user (e.g., success rate of identifying and accessing the information needed by the user);

• **Service quality.** How well a service or activity is done (e.g., percentage of transactions in which users acquire the information they need);

• **Impact.** How a service made a difference in some other activity or situation (e.g., the degree to which network users enhanced their ability to gain employment or pursue business);

• **Usefulness.** The degree to which the services are useful or appropriate for individual users (e.g., percentage of services of interest to different types of user audiences); and

• **Adoption.** The extent to which institutions or users integrate and adopt electronic networked resources or services into organizational or individual activities (e.g., answering reference questions, generating interlibrary loan requests).

These types of criteria provide an important roadmap for thinking about the various data elements and statistics that would be necessary to produce such measures as well as providing a quality measurement framework for library networked services and resources.

<table>
<thead>
<tr>
<th>Network Evaluation Criteria</th>
<th>Extensiveness</th>
<th>Efficiency</th>
<th>Effectiveness</th>
<th>Service Quality</th>
<th>Impact</th>
<th>Usefulness</th>
<th>Adoption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network Component</td>
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<tr>
<td>Technical Infrastructure</td>
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<td>Information Availability</td>
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<td>Information Services</td>
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<tr>
<td>Support</td>
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<tr>
<td>Management</td>
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</table>

Figure 4. The Network Component Model.

**The Network Component Model as a Quality Measurement Tool**

As Figure 5 shows, the Network Component Model also serves as a mechanism through which to measure the quality of specific aspects of a library’s networked services and resources using a number of evaluation criteria. It is possible to examine the technical infrastructure aspect of a network and consider network statistics and performance measures for that aspect along the evaluation criteria of extensiveness, efficiency, and so on. This framework enables one to map the network statistics and performance measures presented in Figures 2 and 3. For example:

• Technical Infrastructure and Extensiveness: Number of public access Internet workstations, maximum bandwidth of public access Internet workstations;
• Technical Infrastructure and Service Quality: Public access Internet workstations in proportion to the population of legal service area;
• Information Content and Efficiency: Percentage of remote library visits, number of users of electronic resources and services;
• Information Services and Extensiveness: Number of database sessions, percentage of serial titles offered in electronic form;
• Information Services and Efficiency: Percentage of electronic materials use of total library materials use; and
• Support and Extensiveness: User IT instruction, staff IT instruction.

Figure 5 also presents additional statistics and measures that selected library and state library staff and administrators, as well as various government officials and governing board members, found of interest. These include:

• Information Services and Service Quality: Number of rejected logins, percentage of rejected sessions to total sessions; and
• Management and Efficiency: Cost of online subscription material, cost per session/visit.

These statistics and measures, however, require additional development and testing.

The Quality Picture

Through these statistics and measures, it is possible to gain a sense of the quality of networked services and resources in specific areas or across a number of areas. Moreover, by selecting statistics and performance measures relevant and of interest to library staff and managers (required for reporting purposes) or other motivational factors, it is possible for libraries to develop an overall sense of their networked services and resources along the network dimension and evaluation criteria.

For example, should libraries desire to measure the quality of their database information services, they could use the following questions:

• How much? Such statistics and performance measures as the number of full-text titles available by subscription, number of database sessions, number of items examined using subscription services, and percentage of serial titles offered in electronic form.
• How well? Such statistics and performance measures as the number of rejected sessions, percentage of rejected sessions to total sessions, percentage of the time the network is functioning.
• Is it cost effective? Such statistics and performance measures as the cost of online subscription material, cost per session/virtual visit.
• With what effort? Such statistics and performance measures as the number of staff hours spent servicing public service information technology (IT), user IT instruction, and percentage of the population receiving IT instruction in the legal service area for public libraries.
<table>
<thead>
<tr>
<th>Types of Measures</th>
<th>Network Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical Infrastructure</td>
<td>Information Content</td>
</tr>
<tr>
<td>How much of a service the network provides</td>
<td>Technical aspects of the network (e.g., workstations, communications equipment)</td>
</tr>
<tr>
<td>Extensiveness</td>
<td>• (W) Number of public access workstations</td>
</tr>
<tr>
<td></td>
<td>• (W) Maximum bandwidth of public access Internet workstations</td>
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<tr>
<td></td>
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</tbody>
</table>

Figure 5. Network Library Quality Statistics and Performance Measures (Continued on p. 770).
<table>
<thead>
<tr>
<th>Types of Measures</th>
<th>Network Components</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Efficiency</strong></td>
<td></td>
</tr>
</tbody>
</table>
| The use of resources in providing or accessing network resources or services | - (W) Number of public access Internet workstation users  
- Average annual use per public access Internet workstations  
- (ES) Level of paid public service effort in servicing IT  
- (ES) Level of paid public service effort in servicing IT |
|                  | - (D) Percentage of electronic materials use of total library material use  
- (D) Total library materials use |
|                  | - Cost of online subscription material (e.g., e-books, databases)  
- Cost per session/visit |
| **Service Quality** | Number of rejected sessions  
- Percentage of rejected sessions to total sessions  
- Percentage of time network is functioning (e.g., up) |

How well a service or activity is done.
<table>
<thead>
<tr>
<th>Adoption</th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>The extent to which institutions or users integrate and adopt electronic networked resources or services into organizational or individual activities</td>
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<td></td>
</tr>
<tr>
<td>(ES) Number of virtual reference transactions</td>
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<td></td>
</tr>
<tr>
<td>(ES) Total reference activity</td>
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<td></td>
</tr>
<tr>
<td>(ES) Percentage of virtual reference to total reference activity</td>
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</tbody>
</table>

W=Workstations  ES=Electronic Services  D=Databases  VV=Virtual Visits  I=Instruction

- Network statistic *(italics indicates additional possible statistics)*

- Performance measure *(italics indicates additional possible performance measures)*

Figure 5. Network Library Quality Statistics and Performance Measures.
Academic libraries could substitute campus populations such as student body, faculty, staff, and so on.

Such a systematic approach to network service quality measurement thus provides a library the ability to look in-depth at particular aspects of their networked services and resources.

*Issues with Statistics, Performance Measures, and Framework*

A review of the statistics, performance measures, and framework points to a number of issues that require additional research and testing:

- Network service and resource measurement across library types. Many of the statistics and performance measures presented in Figures 2 and 3 were developed in the public library and/or statewide library network environments. It is unclear as to whether these statistics and measures apply across an ever-complex library environment of cooperatives, consortia, regionals, multi-type digital libraries, or institutional libraries such as academic, research libraries, or others. There is a sense that some (i.e., online database statistics and performance measures) do translate across libraries or library service providers, but which ones, in what context, and so on, remains untested.

- Time-sensitive statistics and performance measures. Many of the statistics and performance measures presented in Figures 2 and 3 will have a limited utility time. Technology changes, measurement needs change, and libraries change. Thus, network statistics and performance measures will be in a continual state of development, testing, modification, and adoption.

- Control of the data. Some of the most central data to libraries is now out of the control of libraries—i.e., online vendor databases. Thus, the ability of libraries to collect, analyze, and use critical data is dependent on the ability of libraries to receive desired data back from the vendors in a timely, uniform, and consistent manner.

- Critical gaps. Figures 4 and 5 clearly demonstrate that there are a number of evaluation criteria and network components for which there are no tested statistics and performance measures to determine the quality of those networked services and resources. In particular, there is a need for quality indicators in key evaluation criteria of impact and usefulness. At present, quality measurement is limited to predominantly technology-generated logs, counts of equipment and/or equipment usage, and transaction data (e.g., reference). The more difficult questions of impacts, benefits, outcomes, and barriers remain unanswered.

- Mutual exclusivity of the statistics and performance measures. The quality framework presented in Figure 5, while parsimonious, has the obvious limitation of oversimplification. That is, a number of statistics and performance measures can serve as quality measures along more
than one evaluation criterion. For example, one might use the number of virtual reference transaction statistics as both a quality indicator of information services' extensiveness and adoption.

- Evolving methodologies. In part, the limitations to the types of network statistics and performance measures presented in the article are a result of the limitations of current data-collection techniques. More often, researchers rely on qualitative methods to gain a sense of user-based impact and utility measures. Relying on these methodologies to measure service quality across libraries, library types, and so on, is problematic at best. There is a need to modify existing data-collection techniques and/or develop new techniques (i.e., Web log file analysis) to better address measurement in the networked environment.

- Library data collection, analysis, and presentation management system. The research activities demonstrated that, in general, public libraries do not engage in a systematic quality-focused data-collection system. Few, if any, have staff that are responsible specifically for library-wide data-collection efforts, analysis efforts, or reporting and presentation efforts. Moreover, library staff may not be appropriately trained in the various methodologies and data analysis techniques required to engage in statistical and performance measurement activities. Were it not for state library and/or local governance mandated data-collection efforts, it is likely that many public libraries would engage in few, if any, data-collection efforts beyond circulation and visit counts. The data-collection situation is particularly problematic in the networked environment, as data-collection efforts in this area require additional technical and research skills.

These issues point to the need for additional research, testing, and validation in the area of network resources and services quality measurement. They also indicate a need for libraries to work with vendors to receive desired usage reports, as well as the enhancement of librarian technical, evaluation, and methodological skills to better understand the networked environment.

**Next Steps**

The framework presented in this article shows that it is possible to develop, define, and collect a number of statistics and performance measures that reflect networked library services and resources. The statistics and measures, however, reflect the embryonic state of network service and resource measurement due to a number of methodological, organizational, and complexity issues. As such, a large number of the statistics and measures reflect a "counting" approach to measurement.

While an important first step to network service and resource measurement is establishing a foundation for measurement, it is important
to move beyond counting instances and occurrences. The SERVQUAL methodology, which is reviewed substantially in other articles in this journal issue, provides a robust framework that network measurement activities need to consider in moving toward developing user-based measures of library network service quality. For example, a clear starting point is to consider statistics, performance measures, and approaches that incorporate the Gaps Model of Service Quality (Zeithaml, Parasuraman, & Berry, 1996):

- Gap 1—customers’ expectations and management’s perceptions of these expectations;
- Gap 2—management’s perceptions of customer’s expectations and service quality specifications;
- Gap 3—service quality specifications and actual service delivery;
- Gap 4—actual service delivery and what is communicated to customers about it; and
- Gap 5—customers’ expected services and perceived service delivered (p. 16).

These gaps provide an overall research approach within which the network statistics and performance measure model presented in Figure 5 can serve to guide the development of specific network statistics and performance measures with the gap dimensions. As research in this area continues, adopting a user-based approach to library network service quality assessment is critical.

CONCLUSION

The network statistics, performance measures, and quality framework presented in this article consolidate the findings from a number of research activities conducted over several years. It is clear, however, that the development of service quality measures for libraries in the networked environment is still in the initial stages. It is also clear that, as library network usage measurement evolves, it is necessary to incorporate user-based quality assessment approaches such as those offered through the SERVQUAL methodology.

To stimulate research and practice in this area, though, it may be necessary to balance the more rigorous requirements of valid and reliable data with the very real needs of libraries and librarians of all types to demonstrate, in a standardized manner, the use and uses of their networked resources and services. This is not to say that researchers and practitioners should abandon sound social science research practices in their efforts to develop methodologies, variables, statistics, and performance measures that yield accurate, valid, and reliable network resource and service usage and quality data. Rather, in a rapidly evolving and constantly changing environment, such as the networked environment, researchers and
practitioners are likely to be in a continual cycle of developing new measures or modifying existing ones and developing new methodologies or modifying existing ones. This perpetual "under construction" scenario requires researchers and practitioners to experiment with new approaches to service quality measurement until such approaches are accepted by the broader research and library communities.

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