The Value of Library and Information Services in Hospitals and Academic Health Sciences Centers

FINAL REPORT
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David Rice contributed the design of the image appearing on the cover of this report. The five lines in the image correspond to the five mission-level concepts in the taxonomy of LIS contributions. One line signifies both an open book and the letter “v” for “value.” The integration of the computer screen within the five lines reflects the contributions of library and information services to the larger organization.

Most significantly, the researchers are indebted to the LIS directors and institutional administrators who served as anonymous participants in the four pilot interviews and twelve interviews, the five participants in the hospital administrators’ focus group, and the 105 respondents to the Web-based questionnaires. This success of this study is a result of the willingness of these 126 individuals to donate their time and offer their insights.
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1 Executive summary

Sponsored by the Medical Library Association, this study addressed two research questions:

- What is the value of using library and information services to the hospital or academic health sciences center? and
- What do institutional administrators consider to be valid measures of the contributions of library and information services (LIS)?

Following a review of the literature, the researchers conducted three phases of data collection: a series of interviews with LIS directors and institutional administrators at hospitals and academic health sciences centers; a focus group of hospital administrators, and Web-based questionnaires for LIS directors and institutional administrators at hospitals and academic health sciences centers.

The researchers relied on the balanced scorecard approach as a framework and used the data collected to develop a taxonomy of LIS contributions to organizational goals in hospitals and academic health sciences centers. This taxonomy organizes LIS contributions on the basis of mission-level concepts and organizational goals.

Among measures of the value of LIS, this study differentiates measures of contribution from measures of performance. Measuring the contribution of LIS requires evidence of the relationship between specific services and organizational goals, evidence that may be gathered from LIS users. After the relationship between specific services and organizational goals has been established, contributions may be measured through service use and outcomes data. Performance data may be gathered to complement contribution data. Measures of LIS performance include user satisfaction, characteristics of library staff and data on LIS services such as turnaround time.

When applying the results of this study, LIS directors should identify the mission-level concepts, organizational goals and LIS contributions that are most relevant to their specific setting. Data from the questionnaires, however, suggest that LIS directors are in strongest agreement about the potential contributions of LIS to clinical learning, clinical care, and meeting accreditation standards in their organizations. LIS directors in academic health sciences centers are also in strong agreement about the potential contribution of LIS to the provision of resources necessary for teaching and learning. Institutional administrators were in agreement with LIS directors about the potential contributions of LIS to the organizational goals of clinical learning and the provision of resources necessary for teaching and learning. However, the strength of agreement about the potential contribution of LIS toward clinical care was not as strong among institutional administrators as among LIS directors. Increasing profitability was the organizational goal that received the lowest level agreement among both LIS directors
and institutional administrators in terms of potential LIS contributions, reflecting a common perception that LIS do not generate revenue or reduce cost for an organization.

This report includes a number of sample instruments that may be adapted to specific settings in order to gather LIS contribution and performance data. These sample instruments include a survey for establishing the relationship between services and organizational goals, a user satisfaction survey, an instrument for gathering data on activities supported by LIS use, and sample focus group questions for gathering qualitative data on the contributions and performance of LIS.

Five recommendations emerge from this study. The first three are addressed to LIS directors seeking to understand and communicate the value of their services to the larger organization. The fourth recommendation is for continued testing and development of this study’s instruments for gathering institution-specific LIS contribution and performance data. The final recommendation calls for the Medical Library Association and the Association of Academic Health Sciences Libraries to collaborate with the Accreditation Council for Graduate Medical Education to improve the accreditation criteria related to libraries and information services.

2 Introduction

2.1 Context: MLA’s request for proposals

Recognizing the importance of effectively communicating the value of LIS, the Medical Library Association sponsored a study of the contributions of these services in hospitals and academic health sciences centers. It is important to recognize, however, that other initiatives have called for the collection of data related to library services in health care settings, primarily to support cross-institutional comparisons. Libraries in academic health sciences centers have contributed operational data to the Association of Academic Health Sciences Libraries (AAHSL) annually since 1974 [1]. Among these data are budget estimates and indicators of use, including circulation counts. A related data collection effort is currently being developed for hospital libraries as part of a benchmarking initiative [2].

MLA issued its request for proposals for this study on February 22, 2000. The University of Maryland assembled a team of two faculty members and a doctoral student who responded with a proposal that highlighted the balanced scorecard approach to measuring and communicating value. The faculty members were Keith Cogdill, principal investigator, and Eileen Abels, co-principal investigator. The doctoral student, Lisl Zach, brought to the study extensive professional experience in administration and management as well as a research interest in the information needs and information seeking behaviors of organizational administrators.
2.2 Multiple approaches to value

Two basic approaches to value include a business model focused on quantifiable, firm-level performance measures, and a service model focused on qualitative, user-centered measures.

The traditional business model is based on quantifying the benefit or impact of a product or unit on the bottom line of the organization, either in terms of the profit that it contributes or of the service it provides. Two well-known financial concepts used to measure value are return on investment (ROI) and cost/benefit analysis [3]. Both techniques rely on the ability to quantify the actual costs of the product or unit being measured as well as the cost savings or cost benefits that are produced. Challenges arise with both of these quantitative techniques when applied to units providing intangible services. As in the case of library and information services, it is often difficult, if not impossible, to isolate the contribution or impact of the service provided in terms of a specific outcome [4]. It is also difficult, and very cumbersome, to identify the costs of individual services, since often there is no single, identifiable product associated with the work performed by a library’s staff. In the absence of a tangible product with a quantifiable return or benefit, libraries and information centers typically rely on anecdotal evidence of time or effort saved in order to demonstrate their value to the organization [5]. Although these savings may be very real, they are hard to quantify in terms of a cost/benefit analysis.

On the other hand, the traditional LIS model has frequently focused on measuring the value of LIS to individual users rather than on their impact at an institutional level. These measures have been based largely on individual users’ estimates, such as the amount of time or money saved as a consequence of using LIS [6, 7]. The validity of much of these data may be questioned, however, to the extent that they are based on responses to hypothetical questions such as, “How much time would you have spent?” or “How much money would you have paid?” Further, individual perceptions or estimates do not necessarily translate into measurable benefits to the bottom line for an organization; that is, these measures are more likely to reflect users’ beliefs or their personal satisfaction rather than directly quantifiable benefits to the organization. This is more deeply complicated by the fact that many sources or channels of information may be used to address the same need, and isolating the specific contribution associated with LIS in such instances is impossible. Attempts to measure the contributions of LIS within this mix of channels have been made by asking users to compare the information received from the library or resource center with that received from other channels [8]. Unfortunately, research has shown that in many cases LIS may not be one of the most frequently used channels for information, even when LIS-derived information may be of higher quality [9].
2.3 This study’s approach to value

For the purpose of this study, the researchers used the concept of supporting the organizational mission as the ultimate measure of value. However, since this support is not readily quantifiable, an intermediate step was taken to identify measures reflecting the level of contribution. Unlike value, which is generally measured in monetary terms, the level of contribution can be measured by the proportion of a population using a given service, for example. That is, to the extent that LIS can be shown to make a contribution to achieving any of the organization’s mission-related goals, it is deemed to be contributing to the bottom line, even if the specific benefit of the contribution cannot be isolated or measured in monetary terms.

Using the concept of supporting the organizational mission as the ultimate measure of value is based on an approach to measuring organizational performance called the “balanced scorecard” [10]. This approach advocates the collection of both quantitative and qualitative measures in order to provide a “balanced” picture of an organization’s performance for institutional administrators. The balanced scorecard approach focuses on the following four mission-level perspectives:

- Financial perspective. Measures that reflect the financial perspective on organizational performance include return on capital employed, profitability and shareholder value.
- Internal business perspective. When considering the internal business perspective, administrators focus on measures of the performance of internal operations generally and core competencies specifically. Internal business issues common in the corporate arena include design productivity, manufacturing excellence and new product introduction.
- Customer perspective. How a company performs from the perspective of its customers is a significant priority for administrators. Issues related to the customer’s perspective include time, quality, performance and cost.
- Learning and innovation perspective. An organization’s ability to improve, learn and innovate is tied directly to its long-term value. Measures that are typically applied to this perspective in the corporate sector include a company’s ability to develop and introduce new products rapidly as well as the percent of sales tied to new products.

These balanced scorecard perspectives form a framework for transforming an organization’s mission and goals into a coherent set of measures by focusing on factors that are considered essential for the organization’s success. This technique, based on identifying “critical success factors,” has been used in a wide range of organizations; one of the strengths of this approach is that it allows each organization to choose those factors that are most relevant in its individual environment.
3 Research questions

Two research questions, framed in MLA’s request for proposals, guided this study. They were:

- What is the value of using library and information services to the hospital or academic health sciences center? and
- What do institutional administrators consider to be valid measures of the contributions of LIS?

4 Study phases

The study addressed the research questions in five phases, beginning with a review of the literature; this process informed the development of an initial taxonomy framework. Three phases of data collection then followed the literature review and the development of the initial taxonomy framework.

4.1 Literature review

The researchers began the study with a review of the literature related to the value of LIS. This review included searches conducted in the literatures of multiple disciplines: business and management (ABI/Inform), health services research (HealthSTAR), health care (MEDLINE), and library and information science (Library Literature and LISA). The questions guiding the review were:

- How do administrators measure the performance of units?
- How can the contributions of intangibles be measured?
- How can the contributions of library and information services be measured?

Appendix A identifies the databases searched and includes documentation of the search strategies. Appendix B is a bibliography of relevant material organized thematically. A separate list of references provides citations to literature mentioned in this report.

Considered broadly, the literature on the value of LIS includes theoretical approaches such as seen in Griffiths [11] and Repo [12]. In her chapter in the Annual Review of Information Science and Technology, Griffiths highlighted the lack of consensus on the idea of value. The understanding that framed her review of the literature builds on the ideas that value can be expressed in terms of monetary equivalence, that value is subjective, that value assessments are situation-dependent, and that value can be understood in positive terms as benefits or negative terms as detriments. Griffiths pointed to the prevalence of the idea of willingness to pay in studies of the value of library and information services. Paralleling Griffiths’s quantitative approach, Repo outlined economic, accounting and management approaches to the value of library and information services.
Among applied approaches to value, Saracevic and Kantor’s study [13] differentiated the study of the value of information from the study of the value of library and information services. Building on this differentiation, Kantor and Saracevic’s study entailed collecting data from research library users in order to construct a “value-in-use” taxonomy.

A number of studies have considered the impact of LIS on clinical care, including King [14], Marshall [15], and Klein [16]. King and Marshall’s studies relied on clinicians to assess retrospectively the impact of mediated searches on patient care. Klein’s study considered the relationship between the timing of mediated search requests for specific patients and the lengths of their hospital stays.

4.2 Development of initial taxonomy framework

The researchers developed an initial taxonomy of the contributions of LIS in hospitals and academic health sciences centers based on results of the literature review. It should be noted that the term “taxonomy” is not used in the traditional biological sense; that is, the term is used to refer to a polyhierarchical classification in which individual components may appear more than once. This use of the term is prevalent in library and information science.

Following the literature review, the validity of the initial taxonomy was tested during pilot interviews with LIS directors and institutional administrators in a community hospital and an academic health sciences center. The four pilot interviews provided insight into the taxonomy as well as the interview process itself. The taxonomy was modified and validated further based on findings from the subsequent phases in the study -- the interviews, focus group and questionnaires.

4.3 Interviews

Following pilot interviews with LIS directors and institutional administrators in one hospital and one academic health sciences center, twelve semi-structured interviews were conducted with LIS directors and institutional administrators in three hospitals and three academic health sciences centers. The goals of these interviews were to modify and validate the taxonomy as well as to collect data on best practices for communicating the contributions of LIS.

4.3.1 Selection and recruitment

The three factors determining the selection of interview sites were location, institutional reputation and institutional support of LIS. Consideration of interview sites was limited to those located in the mid-Atlantic region within a 130-mile radius of College Park, Maryland. Institutional reputation was defined as appearance on the U.S. News and World Report’s annual list of best hospitals [17] or the HCIA-Sachs list of top 100 hospitals [18]. Institutional support of LIS was defined as the library’s total budget normalized by the number of beds in the affiliated hospital.
The recruitment of interview participants was conducted through e-mail and telephone communication with LIS directors at the institutions selected on the basis of the criteria described above. Fifteen institutions meeting the location and institutional reputation criteria described above were contacted by email to request the budget information used to compute the measure of institutional support. Follow-up telephone interviews were conducted with the LIS directors to clarify their responses and to assess their willingness to participate in on-site interviews.

LIS directors at the institutions with the highest levels of institutional support were invited to participate in the on-site interviews. Three hospitals and three academic health sciences centers were selected as interview sites. Two of the three academic health sciences centers were affiliated with private universities, and one was affiliated with a publicly funded university. The LIS directors at the selected institutions were asked to identify an institutional administrator who could be interviewed about the value of LIS. The titles of the hospital administrators who were interviewed were: associate vice-president for professional services, associate vice-president for human resources, and chief academic officer. The titles of the administrators who were interviewed at academic health sciences centers were: provost for health affairs, dean of a school of medicine, and vice-president for education in a medical school.

In advance of the interviews, LIS directors were asked to provide background materials about the library and the institution, including reports and pamphlets.

4.3.2 Questions

During the twelve interviews with LIS directors and institutional administrators, participants were asked to characterize the contributions made by LIS toward the success of the larger organization. Interview participants were also asked how the contributions of LIS are or could be measured and how they are or could be communicated. Appendix C provides the complete schedule of questions addressed in the interviews with LIS directors and institutional administrators.

4.3.3 Pilot interviews

Four pilot interviews were conducted with LIS directors and institutional administrators at a non-university hospital and an academic health sciences center. These pilot interviews had three purposes: to refine the data collection instruments and procedures, to modify the taxonomy of LIS contributions, and to collect data on the methods of communicating LIS contributions.

Several of the contributions identified in the pilot interviews were related to the learning and innovation perspective, such as encouraging the adoption of new technologies and practices. The criterion for a contribution’s inclusion in the taxonomy at this stage of its development was whether it could be measured or had a measurable surrogate. If not, it was eliminated. During the pilot interviews, the issue arose of the ability to isolate LIS...
contributions from other contributors in the organization. On the basis of data collected in the pilot interviews, a number of contributions were eliminated or merged with others to form broader contributions. Reducing length of stay, avoiding hospital admissions and avoiding unnecessary tests were removed from the taxonomy; pilot interviewees noted that there are significant intervening variables for each of these and no valid way of isolating the LIS contribution. Each of these, however, can be understood as a specific example included within the definition of an organizational goal. For example, “reducing length of stay” falls within the organizational goal of providing excellent clinical care.

In addition to identifying LIS contributions, the balanced scorecard perspectives were modified as a result of the pilot interviews. It became evident that the generic categories of the balanced scorecard do not adequately correspond to the missions of hospitals and academic health sciences centers.

Mission concepts identified from the pilot interviews and from institutional document analyses replaced the balanced scorecard perspectives:

- “Clinical care” was added as a mission concept and included elements of learning previously included in the learning and innovation perspective.
- “Management of operations” replaced the internal business perspective.
- “Constituent needs” replaced the customer perspective, as it better represented the idea of institutional constituents, which was found to be confused with LIS customers during the pilot interviews.
- “Research and innovation” replaced the learning and innovation perspective.

The first perspective, clinical care, is a primary focus of hospitals and academic health sciences centers. The second and third perspectives, management of operations and constituent needs, are more generic and applicable in multiple industries. Similarly, the last perspective, research and innovation, is applicable in many industries, though not all.

4.3.4 Interview results

In addition to contributing to the development of the taxonomy, the results of the interviews included findings related to measuring and communicating LIS contributions and performance.

When asked to identify performance measures that can be applied to LIS, institutional administrators and LIS directors pointed to the importance of LIS use data. The use data identified include interlibrary loan requests, reference service requests, gate counts and hits on the library’s Web site. Among academic health sciences LIS directors, the data collected as part of the AAHSL survey are helpful for assessing trends from year to year and for cross-institutional comparisons. Among all LIS directors, user surveys, though typically administered irregularly, are an important tool to understand the performance of the library from the user’s perspective.
Among institutional administrators in both hospitals and academic health sciences centers, anecdotal data about LIS contributions are highly important. Often pointing to the absence of formal performance measures, institutional administrators reported that they rely on the frequency of compliments and complaints about the library and library staff as significant measures. Administrators also pointed out that they rely on their own personal experience with LIS and observations of the library as key performance measures. The absence of a systematic method of measuring LIS performance in relation to the larger organization’s mission and goals suggests that many institutional administrators and LIS directors share an assumption that LIS bring value to the organization as a whole.

When considering how to measure the performance of LIS, the distinction between LIS staff and LIS as an organizational unit was often blurred among interview participants. The performance of LIS staff was a frequent surrogate for the performance of LIS as an organizational unit. An example of this is the reliance on the LIS director’s job performance as a surrogate for LIS performance. The participation of LIS staff on institutional committees is another example of the blurring of staff performance and LIS performance. The LIS director’s budget management ability is another staff performance area that is conflated with LIS performance.

When asked about methods of communicating LIS performance, LIS directors and institutional administrators indicated that they rely on:

- Reports of the frequency of LIS use,
- LIS annual reports,
- LIS budget reports,
- Formal meetings between the institutional administrator and LIS director, and
- Informal “mediated” communication of compliments and complaints to the institutional administrator from LIS users.

LIS directors emphasized the need for an ongoing collection of data on LIS use and users’ satisfaction. LIS directors wanting location-specific use data have encountered difficulty in obtaining consistent reports of use from vendors of Web-based resources. Vendors currently report use with a variety of metrics, and not all provide reports of location-specific use such as use in clinical settings.

When hospital administrators and hospital LIS directors were asked to explain why their hospital has a library, a consistent response was to point to the Accreditation Council for Graduate Medical Education’s requirement that residents in many programs have access to a medical library’s collection and bibliographic databases.

4.4 Focus group

As in the interview phase, the goals of the focus group of hospital administrators were to modify and validate the taxonomy of LIS contributions and to collect data on methods of communicating the value of LIS. The focus group was held in conjunction with the annual meeting of the Maryland Hospital Association on June 8, 2001. The focus group
meeting was held in the same facility as the Maryland Hospital Association’s meeting, immediately after its conclusion. While the interviews were with institutional administrators who supervise LIS directors, the focus group provided an opportunity to collect data from other institutional administrators.

4.4.1 Selection and recruitment

To recruit institutional administrators for the focus group, members of the Maryland Association of Health Sciences Librarians (MAHSL) were contacted by email. Each MAHSL member was asked to identify an administrator from his or her organization who might be attending the annual meeting of the Maryland Hospital Association. Each administrator identified by a MAHSL member librarian was then contacted by telephone or email to invite his or her participation. Each administrator was given an honorarium of $50 in exchange for participating in the focus group. The focus group included five senior-level administrators from academic (university-affiliated), teaching (not university-affiliated), and non-teaching hospitals.

4.4.2 Questions

Appendix E provides a full report of the focus group meeting, including the questions asked and a summary of participants’ responses. The questions addressed the reasons for maintaining LIS, the contributions LIS make to the larger organization, and how these contributions could be measured and communicated.

4.4.3 Focus group results

Following the administrators’ focus group, the taxonomy’s framework was modified again, largely to simplify its organization. The most significant changes were the integration of customer satisfaction into the other components and the creation of the service mission concept. Education emerged as a separate mission concept, as it had appeared in all the mission statements for interview sites in some form and was emphasized during interviews as well as the focus group. While all the hospital interview sites hosted residency programs, the educational mission concept can logically be extended to continuing professional education in non-teaching hospitals.

In addition to contributing to the development of the taxonomy, the focus group provided an opportunity to validate findings from the interviews related to methods of measuring and communicating the performance and contributions of LIS. Focus group participants underscored the importance of LIS for patient care and for complying with accreditation standards, both for the Accreditation Council for Graduate Medical Education and the Joint Commission on Accreditation of Healthcare Organizations. Focus group participants pointed to use statistics, feedback from LIS users and the performance of LIS staff as measures of LIS performance. Participants also indicated that they rely on the level of support for LIS among their clinical staff as a measure of LIS performance.
4.5 Questionnaires

The final phase of the study entailed administering separate Web-based questionnaires to LIS directors and institutional administrators with the goal of collecting data on (1) the validity of the contributions of LIS specified in the taxonomy and (2) methods for measuring and communicating LIS contributions.

Links to the questionnaires were sent to LIS directors and institutional administrators at academic health sciences centers in the United States belonging to the Association of American Medical Colleges (AAMC) and at hospitals represented in the Medical Library Association’s Hospital Libraries Section. Questionnaire respondents rated their level of agreement about the potential contribution of LIS to each of the fifteen organizational goals in the taxonomy, based on their understanding of the contributions that could be made by an ideal library or information center. Appendix F provides the text of the LIS directors’ questionnaire. Appendix G provides the text of the institutional administrators’ questionnaire.

As a result of extensive pilot testing involving the study’s consultants and participants in the interview and focus group phases, the questionnaire instruments moved from collecting data at the level of individual measures to the broader level of assessing the potential contributions of LIS to organizational goals. Feedback from pilot testers consistently underscored the importance of keeping the instruments brief. By focusing on LIS contributions to organizational goals rather than specific measures of LIS contributions, the questionnaires provided the opportunity to validate the taxonomy further and to explore potential differences in how institutional administrators and LIS directors perceive LIS contributions.

4.5.1 Questionnaire samples

LIS directors and institutional administrators at 120 randomly selected hospitals and academic health sciences centers were invited to complete the questionnaires. The sample size was selected with the goal of achieving data saturation among the responses to the open-ended questions and at least 30 responses from institutional administrators, the population for which a lower response rate was anticipated. No a priori hypotheses were to be tested, obviating the need for the sample size to be determined by a power analysis.

Links to the LIS directors’ questionnaire were sent in emails to 60 LIS directors at non-university hospitals and 60 LIS directors at academic health sciences centers. The non-university hospital LIS directors were randomly selected from among the members of MLA’s Hospital Libraries Section. The academic LIS directors were at institutions randomly selected from among the Association of American Medical College’s (AAMC’s) institutional members in the United States.

The recruitment of institutional administrators took place with the assistance of LIS directors. The AHA Guide to the Health Care Field [19] was consulted to identify the
senior health care administrator at each of the randomly selected academic health sciences centers and hospitals. Each hospital LIS director was emailed to invite his or her participation as well as to request the email address of the senior administrator who had been identified in the AHA Guide to the Health Care Field. Similarly, each academic LIS director was emailed to invite his or her participation as well as to request the email address of the senior administrator identified in the AHA Guide to the Health Care Field. The AAMC Directory [20] was also consulted to identify the deans of the medical education programs at the randomly selected academic health sciences centers. The email addresses of the randomly selected deans were retrieved through searches of the World Wide Web and confirmed in email correspondence with the academic LIS directors.

Links to the institutional administrators’ questionnaire were sent in emails to the 25 senior administrators at non-university hospitals whose email addresses had been provided by LIS directors. At academic health sciences centers, links to the institutional administrators’ questionnaire were sent to the 60 deans of the medical education programs that had been randomly selected from those in the United States belonging to the AAMC. Among the sample of deans, 3 asked to be excluded from the study and 6 had non-working email addresses. Finally, links to the institutional administrators’ questionnaire were also sent to 30 senior administrators at hospitals and health systems closely affiliated with medical education programs. These email addresses were provided by the LIS directors. Among the academic hospital administrators, 5 asked to be excluded from the study. Thus, the final sample of institutional administrators included 25 non-university hospital administrators, 51 deans of medical education programs and 25 academic hospital administrators.

Three customized emails were sent to each potential questionnaire participant. The text of these emails is provided in Appendix G. The first email provided an introduction to the general nature of this study and indicated that a second email would be sent in a few days with a link to the questionnaire. The second email provided the link to the appropriate questionnaire instrument and provided the information necessary to obtain informed consent. The third email was sent to each participant one week after the second and served as a reminder with another link to the appropriate questionnaire instrument. In both the first and second emails, potential participants were invited to decline their participation by responding with “exclude” in the subject line of the email.

4.5.2 Questionnaire results

Results from the questionnaires cast light on LIS contributions to organizational goals and methods for measuring and communicating LIS performance.

4.5.2.1 Library directors

Seventy-one of the 120 LIS directors who received links to the LIS directors’ questionnaire completed the instrument, a response rate of 59%. The first fifteen questionnaire items asked respondents to respond to Likert-scale questions about the
potential contributions of LIS to specific organizational goals organized, as in the taxonomy, on the basis of the larger organizational mission concepts. Table 1 shows the proportion of both LIS directors and institutional administrators who selected “strongly agree” or “agree” for each organizational goal to which LIS could contribute. The organizational goals that received the highest level of agreement among LIS directors as potentially supported by LIS were: clinical learning, clinical care, meeting accreditation standards, and providing the resources necessary for teaching and learning. The organizational goals that received the lowest level of agreement among LIS directors as potentially supported by LIS were: improving the lives of community members and increasing the organization’s profitability.

Table 1. Rankings by LIS directors and institutional administrators

LIS Contributions to Organizational Goals

Respondents selecting “Strongly Agree” or “Agree” (percent, rank)

<table>
<thead>
<tr>
<th>Organizational Goal</th>
<th>LIS Directors n=71</th>
<th>Administrators n=34</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical care</td>
<td>70 (98.6%, #2)</td>
<td>29 (85.3%, #7)</td>
</tr>
<tr>
<td>Clinical learning</td>
<td>71 (100.0%, #1)</td>
<td>33 (97.1%, #1)</td>
</tr>
<tr>
<td>Management decisions</td>
<td>65 (91.6%, #10)</td>
<td>22 (64.7%, #13)</td>
</tr>
<tr>
<td>Increase profitability</td>
<td>48 (67.6%, #15)</td>
<td>12 (35.3%, #15)</td>
</tr>
<tr>
<td>Meet accreditation</td>
<td>70 (98.6%, #2)</td>
<td>32 (94.1%, #3)</td>
</tr>
<tr>
<td>Reduce risk</td>
<td>65 (91.6%, #10)</td>
<td>23 (67.7%, #12)</td>
</tr>
<tr>
<td>Organizational learning</td>
<td>68 (95.8%, #5)</td>
<td>32 (94.1%, #3)</td>
</tr>
<tr>
<td>Foster satisfaction</td>
<td>64 (90.1%, #12)</td>
<td>24 (70.6%, #11)</td>
</tr>
<tr>
<td>Foster attractiveness</td>
<td>66 (93.0%, #9)</td>
<td>29 (85.3%, #7)</td>
</tr>
<tr>
<td>Educational programs</td>
<td>68 (95.8%, #5)</td>
<td>32 (94.1%, #3)</td>
</tr>
<tr>
<td>Learning resources</td>
<td>70 (98.6%, #2)</td>
<td>33 (97.1%, #1)</td>
</tr>
<tr>
<td>Foster research</td>
<td>67 (94.4%, #8)</td>
<td>31 (91.2%, #6)</td>
</tr>
<tr>
<td>Adopt innovations</td>
<td>68 (95.8%, #5)</td>
<td>26 (76.5%, #9)</td>
</tr>
<tr>
<td>Patient lives</td>
<td>64 (90.1%, #12)</td>
<td>25 (73.5%, #10)</td>
</tr>
<tr>
<td>Community lives</td>
<td>61 (85.9%, #14)</td>
<td>18 (52.9%, #14)</td>
</tr>
</tbody>
</table>

Table 2 shows the proportion of LIS directors in hospitals and academic health sciences centers responding to each organizational goal as being supported by LIS.
Table 2. Rankings by LIS directors at academic health sciences centers and hospitals

### LIS Contributions to Organizational Goals

Respondents selecting “Strongly Agree” or “Agree” (percent, rank)

<table>
<thead>
<tr>
<th>Organizational Goal</th>
<th>All LIS Directors n=71</th>
<th>Academic LIS Directors n=40</th>
<th>Hospital LIS Directors n=31</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical care</td>
<td>70 (98.6%, #2)</td>
<td>39 (97.5%, #4)</td>
<td>31 (100.0%, #1)</td>
</tr>
<tr>
<td>Clinical learning</td>
<td>71 (100.0%, #1)</td>
<td>40 (100.0%, #1)</td>
<td>31 (100.0%, #1)</td>
</tr>
<tr>
<td>Management decisions</td>
<td>65 (91.6%, #10)</td>
<td>37 (92.5%, #9)</td>
<td>28 (90.3%, #9)</td>
</tr>
<tr>
<td>Increase profitability</td>
<td>48 (67.6%, #15)</td>
<td>27 (67.5%, #15)</td>
<td>21 (67.7%, #15)</td>
</tr>
<tr>
<td>Meet accreditation</td>
<td>70 (98.6%, #2)</td>
<td>39 (97.5%, #4)</td>
<td>31 (100.0%, #1)</td>
</tr>
<tr>
<td>Reduce risk</td>
<td>65 (91.6%, #10)</td>
<td>37 (92.5%, #9)</td>
<td>28 (90.3%, #9)</td>
</tr>
<tr>
<td>Organizational learning</td>
<td>68 (95.8%, #5)</td>
<td>37 (92.5%, #9)</td>
<td>31 (100.0%, #1)</td>
</tr>
<tr>
<td>Foster satisfaction</td>
<td>64 (90.1%, #12)</td>
<td>35 (87.5%, #12)</td>
<td>29 (93.5%, #6)</td>
</tr>
<tr>
<td>Foster attractiveness</td>
<td>66 (93.0%, #9)</td>
<td>38 (95.0%, #8)</td>
<td>28 (90.3%, #9)</td>
</tr>
<tr>
<td>Educational programs</td>
<td>68 (95.8%, #5)</td>
<td>40 (100.0%, #1)</td>
<td>28 (90.3%, #9)</td>
</tr>
<tr>
<td>Learning resources</td>
<td>70 (98.6%, #2)</td>
<td>40 (100.0%, #1)</td>
<td>30 (96.8%, #5)</td>
</tr>
<tr>
<td>Foster research</td>
<td>67 (94.4%, #8)</td>
<td>39 (97.5%, #4)</td>
<td>28 (90.3%, #9)</td>
</tr>
<tr>
<td>Adopt innovations</td>
<td>68 (95.8%, #5)</td>
<td>39 (97.5%, #4)</td>
<td>29 (93.5%, #6)</td>
</tr>
<tr>
<td>Patient lives</td>
<td>64 (90.1%, #12)</td>
<td>35 (87.5%, #12)</td>
<td>29 (93.5%, #6)</td>
</tr>
<tr>
<td>Community lives</td>
<td>61 (85.9%, #14)</td>
<td>35 (87.5%, #12)</td>
<td>26 (83.9%, #14)</td>
</tr>
</tbody>
</table>

When asked to identify measures of LIS performance, LIS directors identified a variety of data, outlined in Appendix H. These include measures of use, data on intention of use (activity associated with use), user satisfaction data, attributes of library staff, indicators of the quality of services, characteristics of the collection and resources made available by the library, and indicators of the library’s involvement in the larger organization.

When asked to identify methods of communicating the contribution of LIS to the larger organization, LIS directors noted both specific methods of communicating and more general strategies. As outlined in Appendix H, the specific methods of communicating included the use of a wide range of media, marketing opportunities, involvement of the library’s staff in the activities of the larger organization, and formal reports to institutional administrators. The more general strategies offered in response to this question included being highly visible and proactive, participating in the generation of grant proposals, and ensuring that the library is responsive to the needs of the organization.

#### 4.5.2.2 Institutional administrators

Thirty-four of the 101 institutional administrators who were sent a link to the questionnaire completed the instrument, a 34% response rate. It should be noted that this
sample of institutional administrators is heavily weighted toward administrators from academic health sciences centers. Among the 34 institutional administrators responding to the questionnaire, nine were from non-university settings.

As shown in Table 1, institutional administrators were in agreement with LIS directors about the potential contributions of LIS toward clinical learning and the provision of resources necessary for teaching and learning. However, the strength of agreement about the potential contribution of LIS toward clinical care is not as strong among institutional administrators as among LIS directors. Increasing profitability is the organizational goal that received the lowest level agreement among both LIS directors and institutional administrators in terms of potential LIS contributions.

Consistent with LIS directors, institutional administrators often pointed to measures of use when asked to identify measures of LIS performance. As outlined in Appendix H, other measures identified by institutional administrators were consistent with those identified by LIS directors: user satisfaction, characteristics of library staff, and attributes of the collection and resources made available by the library. Interestingly, the concept of “library as place” emerged as an LIS performance measure for institutional administrators, subsuming measures such as the number of hours the library is open and the quality of the library’s physical environment.

4.6 Limitations of this study

The research questions guiding this study focus on (1) understanding the value of LIS to the larger organization and (2) identifying measures that can be used to communicate the value of LIS to institutional administrators. Given the nature of these research questions, this study can be characterized as aiming at discovery rather than measurement. Nevertheless, small sample sizes and the possibility of social desirability bias limit the generalizability of this study’s findings. The possibility of a social desirability bias can be tied to the Medical Library Association’s sponsorship of the study and the researchers’ affiliation with a library and information science educational program. In the questionnaire phase of data collection, limitations associated with the samples include the use of deans of medical education programs and not the deans of other health professions programs. A further limitation of the administrators’ questionnaire sample is the limited representation of non-university institutional administrators.

5 Taxonomy and measurement

A primary reason the researchers selected the balanced scorecard as an initial framework for the present study was the inclusion of both quantitative and qualitative data as measures of performance. Initially, the four balanced scorecard perspectives (financial, internal business, customer and learning and innovation) were used to organize the framework within which the researchers sought to develop the taxonomy of LIS contributions in hospitals and academic health sciences centers. The financial perspective was equated with the administrative operations of the hospital or academic health sciences center; the internal business perspective was tied to clinical care.
objectives; the customer’s perspective was linked to the users of the hospital’s or academic health sciences center’s services, including both patients and students; and the learning and innovation perspective was used to represent the extent to which the hospital or academic health sciences center adopted new technologies and practices or pursued original research.

The development of the taxonomy was iterative. Initially, contributions and indicators of value associated with LIS identified from the literature were organized into the four perspectives of the balanced scorecard framework. Table 3 illustrates the relationship between the LIS contributions identified in the literature and the four perspectives of the balanced scorecard framework. As can be seen in the table, the relationship between the contributions and the perspectives is one to many; that is, several contributions can map to more than one of the balanced scorecard perspectives.

5.1 Taxonomy

This study of the value of LIS in hospitals and academic health sciences centers relies on an understanding of value in terms of contributions to organizational success, an understanding that is consistent with the balanced scorecard approach. Table 4 shows the taxonomy of LIS contributions in hospitals and academic health sciences centers that emerged from this study’s literature review and data collection.

The organization of LIS contributions in the taxonomy is based on the organizational mission concepts and the organizational goals derived from the literature and the data collection. Many of the organizational mission concepts, organizational goals and LIS contributions will be common to many hospitals and academic health sciences centers. Others, such as the education and research-related mission concepts, organizational goals and LIS contributions will be more significant for academic health sciences centers than for hospitals.
Table 3. Correspondence between LIS contributions identified in the literature and the balanced scorecard perspectives.

<table>
<thead>
<tr>
<th>LIS Contributions Identified in the Literature</th>
<th>Balanced Scorecard Perspectives</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Financial</td>
</tr>
<tr>
<td>Save time [5, 13, 21]</td>
<td>![bullet]</td>
</tr>
<tr>
<td>Save money [5, 13, 21]</td>
<td>![bullet]</td>
</tr>
<tr>
<td>Avoidance of unnecessary tests [14, 15, 16]</td>
<td>![bullet]</td>
</tr>
<tr>
<td>Avoidance of hospital admissions [14, 15, 16]</td>
<td>![bullet]</td>
</tr>
<tr>
<td>Reduced length of hospital stay [14, 15, 16]</td>
<td>![bullet]</td>
</tr>
<tr>
<td>Improve management decisions [22]</td>
<td>![bullet]</td>
</tr>
<tr>
<td>Increase productivity [23]</td>
<td>![bullet]</td>
</tr>
<tr>
<td>Improve quality of service provided [13]</td>
<td></td>
</tr>
<tr>
<td>Improve clinical decisions [14, 15, 22]</td>
<td>![bullet]</td>
</tr>
<tr>
<td>Avoidance of patient mortality [14, 15, 16]</td>
<td>![bullet]</td>
</tr>
<tr>
<td>Increase patient satisfaction [23]</td>
<td></td>
</tr>
<tr>
<td>Reduce frustration, stress associated with information overload [13]</td>
<td></td>
</tr>
<tr>
<td>Refresh memory [14]</td>
<td>![bullet]</td>
</tr>
<tr>
<td>Substantiate prior knowledge [14]</td>
<td>![bullet]</td>
</tr>
<tr>
<td>Provide new knowledge [14]</td>
<td>![bullet]</td>
</tr>
<tr>
<td>Stay current [13]</td>
<td>![bullet]</td>
</tr>
<tr>
<td>Support research-related needs [22]</td>
<td></td>
</tr>
</tbody>
</table>

*The balanced scorecard’s customer perspective may be seen as representing both institutional customers and LIS customers.
Table 4. Taxonomy of library and information services (LIS) contributions in hospitals and academic health sciences centers

<table>
<thead>
<tr>
<th>ORGANIZATIONAL MISSION CONCEPT</th>
<th>Organizational Goal</th>
<th>LIS Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLINICAL CARE</strong></td>
<td>Provide excellent clinical care</td>
<td>Support informed and timely clinical decision-making.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Support the development of policies and procedures relating to clinical care.</td>
</tr>
<tr>
<td></td>
<td>Promote clinical learning</td>
<td>Provide new knowledge and substantiate prior knowledge about clinical practice.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inform users about current developments in clinical practice.</td>
</tr>
<tr>
<td><strong>MANAGEMENT OF OPERATIONS</strong></td>
<td>Make sound management decisions</td>
<td>Support informed and timely management decisions.</td>
</tr>
<tr>
<td></td>
<td>Increase profitability</td>
<td>Provide resources and services that save organizational staff time.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Provide resources and services that increase organizational staff productivity.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Provide resources and services that reduce organizational expenditures.</td>
</tr>
<tr>
<td></td>
<td>Meet accreditation standards</td>
<td>Provide resources and services that lower costs of patient care.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maintain information required for responses to accrediting bodies (Liaison Committee on Medical Education, Accreditation Council for Graduate Medical Education, Joint Commission on Accreditation of Healthcare Organizations).</td>
</tr>
<tr>
<td></td>
<td>Meet accreditation standards related to information management (Liaison Committee on Medical Education, Accreditation Council for Graduate Medical Education, Joint Commission on Accreditation of Healthcare Organizations).</td>
<td></td>
</tr>
<tr>
<td>ORGANIZATIONAL MISSION CONCEPT</td>
<td>Organizational Goal</td>
<td>LIS Contribution</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>---------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Reduce corporate risk</td>
<td></td>
<td>Disseminate information on best practices.</td>
</tr>
<tr>
<td>Increase corporate compliance</td>
<td></td>
<td>(assist in compliance with health care regulations and copyright restrictions).</td>
</tr>
<tr>
<td>Provide an organizational learning environment</td>
<td></td>
<td>Provide leadership in information management for the organization.</td>
</tr>
<tr>
<td>Foster satisfaction among current staff</td>
<td></td>
<td>Provide information about developments in information technologies and resources.</td>
</tr>
<tr>
<td>Foster institutional attractiveness</td>
<td></td>
<td>Support professional development of staff.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Provide physical environment conducive to studying and learning.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Support professional development of staff.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Provide physical environment conducive to studying and learning.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reduce frustration and stress attributed to information overload.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Enhance institutional attractiveness to prospective clinical staff.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Enhance institutional attractiveness to students.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Provide physical environment conducive to studying and learning.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Provide easy and convenient access to information resources.</td>
</tr>
<tr>
<td>ORGANIZATIONAL MISSION CONCEPT</td>
<td>Organizational Goal</td>
<td>LIS Contribution</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>---------------------</td>
<td>------------------</td>
</tr>
<tr>
<td><strong>EDUCATION</strong></td>
<td><em>Provide excellent educational programs</em></td>
<td>Enhance educational programs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Promote academic excellence.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Promote satisfaction with quality of educational programs.</td>
</tr>
<tr>
<td></td>
<td><em>Provide resources and services necessary for teaching and learning</em></td>
<td>Support the identification of information resources to be used for instruction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Provide easy and convenient access to information resources.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Provide information about developments in information technologies and resources.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Support preparation for licensing, certification and re-certification examinations.</td>
</tr>
<tr>
<td><strong>RESEARCH AND INNOVATION</strong></td>
<td><em>Foster research</em></td>
<td>Support research-related needs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Provide information necessary to prevent duplication of research efforts.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Participate on research grants.</td>
</tr>
<tr>
<td></td>
<td><em>Adopt innovative technologies and practices</em></td>
<td>Support development of innovative technologies and practices.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Support the use of innovative technologies and practices.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disseminate information about developments in information technologies and resources.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Provide leadership in information management for the organization.</td>
</tr>
</tbody>
</table>
5.2 Services, contributions and performance

When discussing the value of LIS for the larger organization, three concepts that are important to consider are service, contribution and performance. Appendix I provides a table of public services commonly offered as part of LIS in hospitals and academic health sciences centers. Technical services, although required for the provision of public services, are not identified in this table. In discussions of the value of LIS, it is important to recognize that users and institutional administrators may focus on public services without considering the significance of the technical services undergirding the public services available to them. When assessing and communicating the value of LIS for an organization, however, it is necessary to relate specific services to organizational goals. For that reason it is helpful to consider the services that can be directly tied to the activities of the larger organization rather than the services that are less directly connected to the larger organization.

The idea of contribution is central to this study’s approach to value. Contributions of LIS can be understood as the relationship between specific services and the goals of the larger organization. That is, a given service contributes to the parent organization to the extent that its utilization leads to the fulfillment of an organizational goal. Measures of contribution therefore include measures of use and outcomes of use that can be tied to organizational goal-related activities. Appendix J provides a sample matrix survey designed to collect data on LIS contributions, understood as relationships between specific services and organizational goals.
Performance measures assess how well a service is provided, apart from considerations of whether the service supports the realization of an organizational goal. It is possible for a service to be performed well without contributing to the realization of an organizational goal.

The following measures can be used to collect data on LIS contributions and LIS performance:

Contribution measures

- Measures of use
  - Use by intention, i.e. activity supported by LIS use
  - Use by user group, e.g. clinical staff, administrators, students
  - Use by location, e.g. nursing stations, residents’ lounge

- Outcomes of use
  - Objective outcomes of use
    - Clinical objective outcomes, i.e. clinical outcomes tied to LIS use
    - Educational objective outcomes, e.g. residents’ pass rates
    - Financial objective outcomes, i.e. financial outcomes tied to LIS use
  - Subjective outcomes of use, i.e. reports of incidents in which LIS use contributed to an organizational goal

Performance measures

- User satisfaction

- LIS services measures, e.g. turnaround time for requests and staff performance measures

When differentiating measures of contribution from measures of performance such as user satisfaction, it is helpful to consider the four quadrants of possible values for the two variables. In Figure 1, the optimal quadrant is quadrant II, representing a service that both contributes to an organizational goal and has high user satisfaction, one measure of performance. Services represented in quadrant I contribute to the realization of an organizational goal, but could be improved as evidenced in low user satisfaction. Services in quadrant IV are performed well, as seen in high user satisfaction, but should be modified to be in alignment with an organizational goal. Quadrant III represents
services that are not performed well and do not fulfill an organizational goal. Services in quadrant III need to be transformed to be in alignment with an organizational goal, with attention given to the quality of the transformed service.

**Figure 1: Service contribution and user satisfaction**

<table>
<thead>
<tr>
<th>Quadrant</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Service contributes, but users are not satisfied</td>
</tr>
<tr>
<td>II</td>
<td>Service contributes, and users are satisfied</td>
</tr>
<tr>
<td>III</td>
<td>Service does not contribute, and users are not satisfied</td>
</tr>
<tr>
<td>IV</td>
<td>Service does not contribute, but users are satisfied</td>
</tr>
</tbody>
</table>

5.3 Collecting data on contributions and performance

Based on the previous discussion of contribution and performance measures, the following steps outline how one might collect data on the value of LIS for a specific hospital or academic health sciences center.

- **Select the organizational goals and LIS contributions that are most relevant and that will be the focus of data collection.** In consultation with an institutional administrator, the LIS director may review this study’s taxonomy and select a limited number of organizational goals that are most relevant to the specific environment.

- **Collect data from users on the relationships between services and organizational goals.** Appendix J presents a sample survey for clinical staff, which enables this user group to indicate the strength of the relationships between a limited number of organizational goals and specific LIS contributions. The organizational goals, LIS contributions and the services identified in this survey should be selected on the basis
of the user population being surveyed and institution-specific considerations. The services identified in the survey may be expanded to include more specific services or reduced by eliminating services not offered in a given environment. Options for collecting data from users on the relationship between services and LIS contributions to organizational goals include relying on an instrument that (1) collects binary data in the form of checkboxes rather than the Likert-type scale shown in Appendix J or (2) re-organizes the questions by having the services in a list following each LIS contribution.

- **Collect data on contributions.** Measures of contribution include: use by intention (reported at time of use through request forms and online use surveys), use by user group, and use by location. The previously established relationship between specific services and organizational goals will support the reliance on measures of use as measures of contribution to organizational goals. Data on outcomes of use, both objective and subjective, may also be collected. Focus groups and interviews may be conducted to gather subjective data on outcomes of use. For objective outcomes data, institutional statistics may be related to data on the frequency of LIS use within specific populations. Appendix L provides sample questions that may be used to gather data on LIS users and intended uses. Appendix M provides sample focus group questions that may be used to gather data on outcomes of use as well as performance data.

It should be noted that there is now an absence of standards upon which database vendors may rely when reporting use. Further, database vendors often cannot provide location-specific use data, such as frequency of use in clinical settings. LIS directors and vendors of Web-based resources need to arrive at standards to support reports of use that are as consistent as possible across vendors.

- **Collect data on performance.** Appendix K offers a sample user satisfaction survey. User satisfaction data may also be gathered through focus group questions, as shown in Appendix M. Other measures of service performance beyond user satisfaction include data such as turnaround time and measures of staff performance.

- **Consider whether services should be initiated, terminated or altered.** Results of the matrix survey may identify organizational goals that are not supported by current services, pointing to the need for new or adapted services. Matrix survey results may also point to services that are not associated with an organizational goal, raising the question of whether the service should be terminated or altered to bring it into alignment with an organizational goal. Whether a service is in alignment with an organizational goal will indicate whether the nature of the service should be transformed. Performance measures for specific services such as user satisfaction may be used to identify opportunities for improving how a service is provided.

- **Regularly collect data on use, outcomes and performance.** While data collection need not be continuous, at regular intervals data should be collected on LIS use and use outcomes to support the communication of the contributions LIS make to the
parent organization. The matrix survey assessing the relationship between organizational goals and specific services does not need to be administered at regular intervals, but will establish the foundation for regularly reporting measures of use as measures of LIS contributions. Regularly collected performance data such as user satisfaction will highlight opportunities for improving those services that have been established as contributors to organizational goals. Both use and performance data may be collected as part of data gathering for other purposes, such as preparing an AAHSL statistics report, gathering LibQUAL data or participating in MLA’s benchmarking initiative.

6 Recommendations

Five recommendations emerge from this study. The first three are addressed to LIS directors seeking to understand and communicate the value of their services to the larger organization. The fourth recommendation is for continued testing and development of this study’s instruments for gathering institution-specific LIS contribution and performance data. The final recommendation calls for the Medical Library Association and the Association of Academic Health Sciences Libraries to collaborate with the Accreditation Council for Graduate Medical Education to improve the accreditation criteria related to libraries and information services.

6.1 Understanding value in terms of contributions to the realization of organizational goals. Consistent with the balanced scorecard approach, this study recommends the collection of data as evidence of LIS contributions to the realization of organizational goals. Evidence of contributions to organizational goals includes both quantitative and qualitative data.

6.2 Measuring LIS contributions. Data that may be gathered as evidence of LIS contributions to the realization of organizational goals include measures of use and outcomes of use. Measures of use include use by intention, which should be gathered at the time of use rather than retrospectively.

6.3 Communicating LIS contributions. Methods of communicating LIS contributions include both formal and informal channels. Regardless of whether an institutional administrator requests data on LIS contributions, regular communication of LIS contributions to the realization of organizational goals should be a sustained priority. Performance data for specific services, such as user satisfaction, may be communicated to complement the LIS contribution data.

6.4 Testing and development of instruments. Going beyond the scope of this study as outlined in its proposal, the researchers are currently pilot-testing the instruments for gathering contribution and performance data. This pilot-testing is being conducted with the participation of a non-university
hospital’s housestaff and is expected to lead to modifications in the instruments.

6.5 Improving LIS-related ACGME accreditation criteria. This study calls for the Medical Library Association and the Association of Academic Health Sciences Libraries to work with the Accreditation Council for Graduate Medical Education to improve the LIS-related residency program accreditation criteria. The criteria for many residency programs currently do not mention access to a library or information services. Others only specify access to a library collection and bibliographic databases without specifying the availability of training provided by a librarian. Given the importance institutional administrators place on these criteria, it is critical that they reflect the broad range of library services that support residency programs.
Deliverables and dissemination of findings

• January 18, 2001 Progress report to MLA
• March 1, 2001 Progress report to MLA
• May 27, 2001 Presentation of preliminary findings by Keith Cogdill at MLA annual meeting in Orlando, Florida
• September 7, 2001 Progress report to MLA
• October 19, 2001 Presentation of preliminary study findings by Keith Cogdill at MAC-MLA meeting in Ocean City, Maryland
• November 2001 Article on taxonomy development accepted for publication in the *Journal of the Medical Library Association*
• January 28, 2002 Progress report to MLA
• March 25, 2002 Presentation of study findings by Lisl Zach at North Carolina AHEC meeting in Winston-Salem, North Carolina
• May 2002 Final report to MLA
• May 2002 Pilot test of matrix survey and satisfaction survey
• May 19, 2002 Presentation of study findings by Keith Cogdill at business meeting during MLA annual meeting in Dallas, Texas
• May 21, 2002 Presentation of study by Stephanie Harris at student papers section during MLA annual meeting in Dallas, Texas
• June 26, 2002 Presentation of study by Keith Cogdill at Maryland Area Health Sciences Libraries (MAHSL) meeting in Bethesda, Maryland
• In progress Submission of article to *National Network*, the newsletter of MLA’s Hospital Libraries Section
• In progress Submission of journal article targeting health care administrators
• In progress Submission of second article to *Journal of the Medical Library Association* on collecting contribution and performance data in specific settings
REFERENCES

1. MEDICAL LIBRARY STATISTICS 1974/75. Dallas: Library, University of Texas Health Science Center, Dallas, 1976.


6. IBID.


11. GRIFFITHS op. cit.


22. **JOINT COMMISSION ON ACCREDITATION OF HEALTHCARE ORGANIZATIONS. 2000**


Appendix A: Literature review search strategies

The goal of this review was to identify applicable indicators of value and their measurable surrogates relevant to hospitals and academic medical centers. This review of the literature formed the foundation for the development of the taxonomy of value indicators, which continued to evolve with data from subsequent phases of the study.

Three specific questions guided the literature searches that shaped the literature review:

- How do administrators measure the performance of units within their organizations?
- How can the contributions of non-tangible services be measured?
- How can the contributions of library and information services be measured?

A systematic approach to finding literature on the value of library services was used. Since the goal was to identify value indicators in a broad sense, we retrieved relevant literature from multiple fields, namely: business, health care, and information and library science.

Five databases were selected for searching:
- ABI/Inform, business and management information;
- HealthSTAR, literature on health services technology, administration, and research;
- MEDLINE, health sciences literature;
- Library Literature; and
- LISA, library and information science literature.

The search strategies were modified for each database according to the controlled vocabulary available, with free-text terms included when necessary. The strategies are provided in the tables below.

Careful records of the search strategies and search results were maintained. Search results were reviewed by members of the project team and relevant articles were selected and obtained. A database of the selected articles was maintained in ProCite. Each article was indexed with themes related to the three questions that guided the search. An item might appear in multiple categories in the bibliography. The database was reviewed regularly by the principal investigator as the project progressed.

HealthSTAR ceased to be a separate NLM database in December 2000. Journal citations previously included in HealthSTAR are now available through PubMed.

In addition to the database searches, relevant literature was also identified from the reference lists of selected papers and from colleagues' recommendations.

Several themes emerged from the literature and were used to organize the bibliography, including:
- value of library and information services,
• performance measures--corporate (including the business literature on performance evaluation, the balanced scorecard approach, cost benefit analysis, and total quality management),
• performance measures--library (including measures of quality, benchmarking, and methods for improving services),
• performance measures--hospital (including benchmarking, best practices, top hospitals, and standards/accreditation),
• valuing intangibles (including customer satisfaction in libraries and hospitals),
• drug information centers--return on investment (ROI), and
• information technology systems--ROI.

Additional searches were conducted for material on rankings of hospitals and academic medical centers and on the value of drug information centers.

**Search Strategies**

<table>
<thead>
<tr>
<th>How do health care administrators measure the performance of units?</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABI/INFORM</td>
</tr>
<tr>
<td>HealthSTAR</td>
</tr>
<tr>
<td>MEDLINE</td>
</tr>
<tr>
<td>Library Literature</td>
</tr>
<tr>
<td>LISA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How can the contributions of intangibles be measured?</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABI/Inform</td>
</tr>
<tr>
<td>HealthSTAR</td>
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<tr>
<td>MEDLINE</td>
</tr>
<tr>
<td>Library Literature</td>
</tr>
<tr>
<td>LISA</td>
</tr>
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</table>
### How can the contributions of library and information services be measured?

<table>
<thead>
<tr>
<th>Database</th>
<th>Search Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABI/Inform</td>
<td>libraries[su] AND productivity[su]</td>
</tr>
<tr>
<td>HealthSTAR</td>
<td>&quot;Library Services/statistics and numerical data&quot;[MeSH]</td>
</tr>
<tr>
<td>MEDLINE</td>
<td>&quot;Library Services/statistics and numerical data&quot;[MeSH]</td>
</tr>
<tr>
<td>Library Literature</td>
<td>(hospital[kw] OR medical[kw]) AND (evaluat?[kw] OR performance[kw] OR contribut?[kw])</td>
</tr>
<tr>
<td>LISA</td>
<td>(&quot;hospital libraries&quot;[su] OR &quot;medical libraries&quot;[su] OR hospital?[kw]) AND &quot;performance measures&quot;[su] OR evaluat?[kw] OR measur?[su]</td>
</tr>
</tbody>
</table>

**Notes**

- ?=truncation symbol
- su=controlled vocabulary term

**ABI/Inform**

kw=searches the basic fields [Author, Abstract, Article Title, Company Name, Geographical Name, Personal Name, Product Name, Subject Terms, Source (publication title)]

**HealthSTAR** and **MEDLINE**

tw= searches all words and numbers in the title and abstract, and MeSH terms, subheadings, chemical substance names, personal name as subject, and MEDLINE Secondary Source (SI) field.

**Library Literature**

kw=searches Notes, Source Phrase, Subject, and Title indexes

**LISA**

kw=searches any single word from any field in the database, including author, title, source, subject, free text, language, publication date, abstract, thesaurus term.

### Additional Searches

### How are hospitals and academic medical centers ranked?

<table>
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<tr>
<th>Database</th>
<th>Search Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABI/Inform</td>
<td>hospitals[su] AND &quot;ratings &amp; rankings&quot;[su]</td>
</tr>
</tbody>
</table>

### What is the value of drug information centers?

<table>
<thead>
<tr>
<th>Database</th>
<th>Search Term</th>
</tr>
</thead>
</table>
Appendix B: Bibliography

**Value of library and information services**


Newcomb, Douglas W. Higher ranked Fortune 500 companies significantly more likely to have libraries. Information Outlook 4(3):12-13, March 2000.


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Morey R, Retzlaff-Roberts DL, Fine D, Loree S. Assessing the operating efficiencies of teaching hospitals by an enhancement of the AHA/AAMC method. American


Corporate performance measures and balanced scorecard approach


**Hospital Performance Measures**


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Library Performance Measures


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**Customer satisfaction – library**

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Morrissey J. The mouse is roaring: Internet technology is slashing the time it takes to get
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Retchin SM, Wenzel RP. Electronic medical record systems at academic health centers:
Advantages and implementation issues. Academic Medicine 74(5): 493-498,
May 1999.


Appendix C: Interview data collection instruments

Librarian Data

Interviewer:  
Interviewee:  
Date:  

Thank for participating.

Review brief description of the project:
- Funded by MLA
- To investigate the contributions and value associated with library services in both hospital and academic settings.

Outline agenda for the interview. I’ll ask questions about:
- How you measure and communicate the library’s performance; and
- Specific contributions the library makes to the larger organization – that is, the value of the library’s services from an organizational perspective.

Obtain signed consent form and permission to tape.

- How do you measure the performance of the library?
- What data do you collect about the library’s performance and how do you obtain it?
- During our preliminary telephone interview, you told us that you report to ______. Is there anybody else to whom you report on the activities of the library?
- Do you know how the performance of the library/information center is measured by your supervisor? Do you know if he/she looks for any particular set of key indicators of value?
- How do you communicate the library’s performance to your supervisor?
- Can you give us some examples of how you think the library contributes to the overall performance of the [hospital/medical center] in four areas:
  1. Clinical care
  2. Management of operations
  3. Customer satisfaction, and
  4. Research and innovation
• [For hospital library director: Finally, can you tell me why you think this hospital has a library?]

• [For academic library director: Finally, I’d like you to imagine that there were no professional degree programs in this medical center. Do you think having a library could be justified without the presence of educational programs?]

• Is there anything else that I should know about how you think the library can communicate the value of the services it provides?

Thank you very much for taking the time to talk with us. Your answers will be very important to the success of this study.
Thank for participating.

Review brief description of the project:
- Funded by MLA
- To investigate the contributions and value associated with library services in both hospital and academic settings.

Outline agenda for the interview. I’ll ask questions about:
- How you measure and communicate the library’s performance; and
- Specific contributions the library makes to the larger organization – that is, the value of the library’s services from an organizational perspective.

Obtain signed consent form and permission to tape.

Collect reports and other materials about the library.

- Can you identify the three to five performance measures that are most important to you when evaluating the performance of the library?
- How is the performance of the library reported to you?
- Are you satisfied with the current reporting of the library’s performance? Is there any additional performance data you would like to receive?
- How do you report the performance of the library to others?
- Can you give us some examples of how you think the library contributes to the overall performance of the [hospital/medical center] in four areas:
  1. Clinical care,
  2. Management of operations,
  3. Customer satisfaction, and
  4. Research and innovation
• [For hospital administrator: Finally, can you tell me why you think this hospital has a library?]

• [For academic administrator: Finally, I’d like you to imagine that there were no professional degree programs in this medical center. Do you think having a library could be justified without the presence of educational programs?]

• Is there anything else that I should know about how you think the library can communicate the value of the services it provides?

Thank you very much for taking the time to talk with us. Your answers will be very important to the success of this study.
Appendix D: Focus group report

June 8, 2001
3:00-4:00

Facilitator: Keith Cogdill
Co-facilitators: Eileen Abels and Lisl Zach

Participants:

Five senior administrators participated in the focus group. These administrators were from hospitals in Maryland that have library services. Titles held by the focus group participants included: president, chief operating officer, vice president for human resources, vice president for medical affairs, and director of clinical information systems. The hospitals represented included:

- Three community hospitals with residency programs but no direct university affiliation,
- One community hospital with residency programs that is also part of a university-owned health system, and
- One university hospital.

Overview and Introductions

The focus group began with Keith Cogdill’s explanation that this meeting is being held as part of a study of health care administrators’ perceptions of the value of library services. Cogdill mentioned that the Medical Library Association is sponsoring this study and thanked the participants for coming.

Cogdill then asked the participants to introduce themselves, to identify the organization they represent and to describe their interactions or relationship with library services in their organization.

All participants except one mentioned that they directly or indirectly supervise library services within their organization. Many indicated that they personally use the library. The participant who does not supervise library services explained that she works with the library to provide access to library resources within the hospital.

The Value of Library Services for the Organization

The next question asked participants to consider why their organization has a library. Cogdill prompted the participants to consider the value of library services from an organizational perspective.
The participant responding first indicated that library services are important for students and residents. Other responses highlighted the importance of library services for research and continuing education.

Participants underscored the importance of access to information in both print and electronic formats. Remote access to information resources was also highlighted as particularly valuable.

The participant who was a hospital president observed that it is important to have a library as a place to “park” librarians. He then went on to discuss how librarians are a valuable resource for his hospital, noting that they keep appropriate information and provide information that is responsive to specific needs. He also noted the significant cost for access to electronic sources.

**Contributions of Library Services to Organizational Mission and Goals**

Cogdill asked participants to share ideas related to how library services contribute to the realization of their organization’s mission and goals.

The first participant responding to this prompt underscored the importance of library services for clinical care. He remarked that physicians are very clear in communicating their need for library services. An indication of physicians’ support for library services is the amount they donate to the library as part of an annual fund raising campaign.

Underscoring the importance of library services for the hospital, one respondent made the claim that, “You can’t operate a hospital without a library.” He went on to discuss the importance of access to information resources such as basic textbooks and drug reference manuals to support clinical decisions.

Another respondent highlighted the importance of the library for accessing information about best practices in clinical care.

The participant who was a hospital president noted the importance of library services in the context of case reviews, when a hospital-wide committee discusses specific untoward events in the hospital. In these situations, library services are important for risk management.

In addition to clinical care, participants noted that library services help realize organizational goals related to supporting continuous learning and maintaining a learning environment. The importance of having local access to print resources and remote access to electronic resources surfaced again in the discussion of supporting continuous learning and maintaining a learning environment.

The participant who was a vice president for medical services pointed to the ACGME requirement for many residency programs that the organization have a library. There was
general discussion that neither ACGME nor JCAHO appears to have specific criteria about library services, apart from there being a library in the organization.

**Measures**

Cogdill then asked the participants to think about the contributions of library services and to identify measures that might be used for each. Cogdill suggested that these measures might also be used to assess the performance of library services.

Participants first focused on data related to the frequency of use of library services. These data include reports of the frequency of use of electronic resources, gate counts, and the number of requests for librarian-mediated searches.

One participant noted that the number of public workstations in the library is a measure of the library’s contribution to the organization.

Turn-around time for search requests and the quality of searches were also identified as measures of library performance.

Another participant noted that traditional statistics such as hits on the library’s Web site, materials borrowed and subscriptions purchased are difficult to link to medical outcomes.

Participants discussed how qualitative data can go beyond traditional library statistics by exploring why resources were used, whether the information retrieved was meaningful, and whether it’s worth the expense of maintaining access. Participants suggested that surveys of clinical and non-clinical staff can be used to collect data about satisfaction with library services and to ask whether there are any new resources that should be purchased.

Participants also noted that whether the library or librarians are held in high regard is a good measure of their performance. Whether library services are talked about favorably is a good measure of their worth to the organization. Participants noted that a survey could be used to collect this data.

The level of support for library services among the medical staff is another qualitative measure of the library’s performance. The desire among medical staff for having the library in a location that is convenient to care units is another measure of its value for clinicians.

Participants noted that they rely on vocal support for library services among the clinical staff as a measure of the library’s value for the organization.

**Communication**

Participants were next asked to describe how the contributions of library services are communicated to them.
The first response came from a participant who noted that he receives a list of the journal subscriptions that the library maintains. He explained that this list is distributed in order to identify any titles that no longer need to be purchased or any that need to be added to the collection.

Other respondents noted that they rely on reports that library staff post on the hospital’s intranet. These reports typically highlight new titles, new services or any changes in current services.

Participants also commented that they rely on the library’s newsletters distributed in print or electronic format. Postings on the library’s Web site are also helpful, as are emails from library staff.

Many of the participants said that they receive monthly reports on the utilization of library services, such as the number of searches executed. These participants noted that they typically pass along portions of the library’s report to other administrators.

Participants also indicated that librarians provide reports at monthly meetings.

Many of the participants also said that they occasionally stop by the library to assess the number of users and the level of activity.

One participant noted that he relies on the medical staff to communicate any problems related to library services. He noted that, “No news is good news.”

Library as Physical Space

As a closing question, Cogdill asked participants to consider whether maintaining the library’s physical presence would be important if all information resources were available electronically.

Participants were in agreement about the importance of the library’s physical presence in their organization. They noted that librarians need to be available somewhere to help with searches and to decide what resources should be purchased.

One participant noted that the library may not need to grow physically. As more resources become available electronically, the library may eventually house librarians but no physical collection. This participant noted that younger members of his hospital’s staff are more comfortable than their older colleagues with relying on electronic access to information.

The vice president of medical services disclosed his personal preference for print over electronic resources.
Conclusion

In closing, Cogdill asked the participants if they had any other thoughts to share about the value of library services.

The responses centered on the need for librarians to market themselves more aggressively. Participants shared their beliefs that librarians should “toot their own horn” and that the library is not given enough publicity. One participant said that the librarian in his hospital has more advanced IT skills than some members of his IT department. He mentioned that this librarian has developed the library’s Web site without support from the IT department.
Appendix E: LIS directors’ questionnaire

The Value of Library and Information Services in Hospitals and Academic Health Sciences Centers

You may complete this survey online, or if you prefer, you can print and fax or mail it to:
Dr. Keith Cogdill
College of Information Studies
University of Maryland
College Park, MD, 20742-4345
Fax: 301-314-9145

I. We are interested in your perception of the possible contributions of library and information services to the parent organization. Please indicate your level of agreement with each possible contribution.

1. An ideal library/library staff contributes to the provision of excellent clinical care.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree

2. An ideal library/library staff contributes to the promotion of clinical learning.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree

3. An ideal library/library staff contributes to sound management decisions.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree

4. An ideal library/library staff contributes to an increase in profitability.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree

5. An ideal library/library staff contributes to meeting accreditation standards.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree

6. An ideal library/library staff contributes to the reduction of corporate risk or liability.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree
7. An ideal library/library staff contributes to providing an organizational learning environment.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

8. An ideal library/library staff contributes to fostering satisfaction among current organizational staff.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

9. An ideal library/library staff contributes to fostering institutional attractiveness.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

10. An ideal library/library staff contributes to the provision of excellent educational programs.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

11. An ideal library/library staff contributes to the provision of resources and services necessary for teaching and learning.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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</thead>
</table>

12. An ideal library/library staff contributes to fostering research.

<table>
<thead>
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<th>Strongly Agree</th>
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<th>Disagree</th>
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13. An ideal library/library staff contributes to the organization's adoption of innovative technologies and practices.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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14. An ideal library/library staff contributes to the improvement of lives of patients and families.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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</thead>
</table>

15. An ideal library/library staff contributes to the improvement of lives of community members.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>
II. Performance Measures

16. Please describe the 3-5 most meaningful performance measures that you could use to evaluate the library's contribution to the organization.

17. Please describe the 3 most effective ways that the library's contributions to the success of the organization can be communicated.

III. Demographics

18. Please select the category that best describes your organization:
   a. Academic health sciences center
   b. Teaching hospital (non-university setting)
   c. Community hospital
   d. VA or military hospital
   e. Multi-hospital system
   f. Other

19. Please select the category that includes the number of beds in your hospital:
   a. 0-99
   b. 100-199
   c. 200-299
   d. 300-399
   e. 400-499
   f. 500 or more
   g. Not applicable (affiliated with multiple hospitals)

IV. If you haven't already done so, please provide the name and email address of your hospital's president or chief executive officer in the spaces below. If your medical education program has multiple hospital affiliations, please identify the president or CEO of the largest hospital.

20. Administrator's Name

21. Administrator's E-mail Address

V. Comments

22. Please use this space to make any additional comments.
Appendix F: Institutional administrators’ questionnaire

The Value of Library and Information Services
in Hospitals and Academic Health Sciences Centers

You may complete this survey online, or if you prefer, you can print and fax or mail it to:
Dr. Keith Cogdill
College of Information Studies
University of Maryland
College Park, MD, 20742-4345
Fax: 301-314-9145

I. We are interested in your perception of the possible contributions of library and information services to the parent organization. Please indicate your level of agreement with each possible contribution.

1. An ideal library/library staff contributes to the provision of excellent clinical care.
   Strongly Agree    Agree    Neutral    Disagree    Strongly Disagree

2. An ideal library/library staff contributes to the promotion of clinical learning.
   Strongly Agree    Agree    Neutral    Disagree    Strongly Disagree

3. An ideal library/library staff contributes to sound management decisions.
   Strongly Agree    Agree    Neutral    Disagree    Strongly Disagree

4. An ideal library/library staff contributes to an increase in profitability.
   Strongly Agree    Agree    Neutral    Disagree    Strongly Disagree

5. An ideal library/library staff contributes to meeting accreditation standards.
   Strongly Agree    Agree    Neutral    Disagree    Strongly Disagree

6. An ideal library/library staff contributes to the reduction of corporate risk or liability.
   Strongly Agree    Agree    Neutral    Disagree    Strongly Disagree

7. An ideal library/library staff contributes to providing an organizational learning environment.
   Strongly Agree    Agree    Neutral    Disagree    Strongly Disagree
8. An ideal library/library staff contributes to fostering satisfaction among current organizational staff.

Strongly Agree    Agree    Neutral    Disagree    Strongly Disagree

9. An ideal library/library staff contributes to fostering institutional attractiveness.

Strongly Agree    Agree    Neutral    Disagree    Strongly Disagree

10. An ideal library/library staff contributes to the provision of excellent educational programs.

Strongly Agree    Agree    Neutral    Disagree    Strongly Disagree

11. An ideal library/library staff contributes to the provision of resources and services necessary for teaching and learning.

Strongly Agree    Agree    Neutral    Disagree    Strongly Disagree

12. An ideal library/library staff contributes to fostering research.

Strongly Agree    Agree    Neutral    Disagree    Strongly Disagree

13. An ideal library/library staff contributes to the organization's adoption of innovative technologies and practices.

Strongly Agree    Agree    Neutral    Disagree    Strongly Disagree

14. An ideal library/library staff contributes to the improvement of lives of patients and families.

Strongly Agree    Agree    Neutral    Disagree    Strongly Disagree

15. An ideal library/library staff contributes to the improvement of lives of community members.

Strongly Agree    Agree    Neutral    Disagree    Strongly Disagree

II. Performance Measures

16. Please describe the 3-5 most meaningful performance measures that you could use to evaluate the library's contribution to the organization.

III. Demographics

17. Please indicate your job title in the space provided below:
18. Please select the category that best describes your organization:
   a. Academic health sciences center
   b. Teaching hospital (non-university setting)
   c. Community hospital
   d. VA or military hospital
   e. Multi-hospital system
   f. Other

19. Please select the category that includes the number of beds in your hospital:
   a. 0-99
   b. 100-199
   c. 200-299
   d. 300-399
   e. 400-499
   f. 500 or more
   g. Not applicable (affiliated with multiple hospitals)

IV. Comments

20. Please use this space to make any additional comments.
Alert Email to LIS Directors

{Name of LIS Director},

In a few days you will receive an email asking you to fill out a questionnaire for an important study sponsored by the Medical Library Association.

It concerns the contributions of library and information services in hospitals and academic health sciences centers. An executive summary and any tools developed as a result of this study will be made available to you.

I am writing in advance, since many people prefer to know ahead of time that they will be contacted. The study is an important one that will help institutional administrators understand the value of library and information services for their organizations.

We will also be administering a parallel questionnaire to institutional administrators. We would greatly appreciate your replying to this message with the email address of Ed Dinan, the senior administrator at your hospital -- or the name and email address of the current senior administrator.

We've worked very hard to make this questionnaire as brief as possible, and it should take less than 10 minutes to complete. If you do not wish to participate, however, simply reply to this email with “exclude” in the subject line.

Thank you for your time. It's only with your generous help that this study can be successful.

Sincerely,

Keith Cogdill, PhD
Assistant Professor, Principal Investigator
University of Maryland
College of Information Studies
4105 Hornbake Building
College Park, MD  20742
(301) 405-1260
kcogdill@wam.umd.edu
Email with Questionnaire Link for LIS Directors

[Name of LIS Director],

I am emailing you to ask your help in a study sponsored by the Medical Library Association. This study seeks to understand the contributions of library and information services in hospitals and academic health sciences centers. We are contacting members of the Hospital Library Section and directors of library services at academic health sciences centers to ask about their perceptions of the contributions of library and information services. Results from the questionnaire will be used to help librarians communicate the value of their services to institutional administrators.

The questionnaire can be accessed at http://cgi.umd.edu/survey/display?ega/MLALIB.

We will also be administering a parallel questionnaire to institutional administrators. If you have not already done so, we would greatly appreciate your replying to this message with the email address of the senior administrator at your hospital or health system. We will also send a link to the dean of your medical education program.

Please take a moment to review the study’s parameters provided at the end of this message and then complete the questionnaire. We’ve worked very hard to make this questionnaire as brief as possible, and it should take less than 10 minutes to complete. If you do not wish to participate, however, simply reply to this email with “exclude” in the subject line.

If you have any questions about the study, please feel free to contact me at (301) 405-1260 or kcogdill@wam.umd.edu.

Thank you very much for helping with this important study.

Sincerely,

Keith Cogdill, PhD
Assistant Professor, Principal Investigator
University of Maryland
College of Information Studies
4105 Hornbake Building
College Park, MD 20742
(301) 405-1260
kcogdill@wam.umd.edu

>>> STUDY PARAMETERS <<<

* Title: The Value of Using Library and Information Services

* Purpose: The purpose of the research is to identify indicators of value and methods of communicating the value of library and information services to administrators in hospitals and academic health sciences centers.

* Age: By completing the questionnaire, participants acknowledge that they are over 18 years of age and wish to participate in the study.

* Procedures: A Web-based questionnaire will be completed.
* Confidentiality: All information collected is confidential, and names of participants will not be identified at any time. The data provided in the questionnaire will be grouped with data others provide for reporting and presentation.

* Risks: The only physical risks involved in this study are those associated with completing a Web-based questionnaire. The researchers will not disclose a participant’s responses to any colleagues within his or her organization.

* Benefits: The investigators will develop a framework that will be useful to libraries and information service providers in hospitals and academic health sciences centers.

TO GO TO QUESTIONNAIRE: http://cgi.umd.edu/survey/display?ega/MLALIB
Follow-up Email to LIS Directors

[Name of LIS Director],

Last week we emailed you a link to a questionnaire about the contributions of library and information services: http://cgi.umd.edu/survey/display?ega/MLALIB

If you have already completed this questionnaire, please accept our sincere thanks. If not, please do so today. We are especially grateful for your help because it is only with your response that this study can be successful.

Also, if you have not already done so, please reply with the email address of the senior administrator at your hospital or health system. Thank you very much,

Keith Cogdill, PhD
Assistant Professor, Principal Investigator
University of Maryland
College of Information Studies
4105 Hornbake Building
College Park, MD 20742
(301) 405-1260
kcogdill@wam.umd.edu
Alert Email to Institutional Administrators

[Name of Administrator],

In a few days you will receive an email asking you to fill out a questionnaire for an important study being conducted by the University of Maryland on behalf of the Medical Library Association.

It concerns the contributions of libraries in hospitals and academic health sciences centers.

I am writing in advance since many people prefer to know ahead of time that they will be contacted. This study is an important one that will help librarians communicate the value of their services.

We've worked very hard to make this questionnaire as brief as possible, and it should take less than 10 minutes to complete. If you do not wish to participate, however, simply reply to this email with “exclude” in the subject line.

Thank you very much for your time. It is only with your generous help that this study can be successful.

Sincerely,

Keith Cogdill, PhD
Assistant Professor, Principal Investigator
University of Maryland
College of Information Studies
4105 Hornbake Building
College Park, MD  20742
(301) 405-1260
kcogdill@wam.umd.edu
Email with Questionnaire Link for Institutional Administrators

[Name of Administrator],

I am emailing you to ask your help in a study being conducted by the University of Maryland on behalf of the Medical Library Association. This study seeks to understand the contributions of library and information services in hospitals and academic health sciences centers.

We are contacting a sample of administrators in hospitals and academic health sciences centers to ask about their perceptions of the contributions of library and information services.

Results of the questionnaire will be used to help health sciences librarians better communicate the value of their services.

The questionnaire can be accessed at http://cgi.umd.edu/survey/display?ega/MLAADMIN.

Please take a moment to review the study’s parameters provided at the end of this message and then complete the questionnaire. We’ve worked very hard to make this questionnaire as brief as possible, and it should take less than 10 minutes to complete. If you do not wish to participate, however, simply reply to this email with “exclude” in the subject line.

If you have any questions about the study, please feel free to contact me at (301) 405-1260 or kcogdill@wam.umd.edu.

Thank you very much for helping with this important study.

Sincerely,

Keith Cogdill, PhD
Assistant Professor, Principal Investigator
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College Park, MD 20742
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STUDY PARAMETERS

* Title: The Value of Using Library and Information Services

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TO GO TO QUESTIONNAIRE: http://cgi.umd.edu/survey/display?ega/MLAADMIN
Follow-up Email to Institutional Administrators

[Name of Administrator],

Last week we emailed you a link to a questionnaire about the contributions of library and information services: [http://cgi.umd.edu/survey/display?ega/MLALIB](http://cgi.umd.edu/survey/display?ega/MLALIB)

If you have already completed this questionnaire, please accept our sincere thanks. If not, please do so today. We are especially grateful for your help because it is only with your response that this study can be successful.

Thank you very much,

Keith Cogdill, PhD
Assistant Professor, Principal Investigator
University of Maryland
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4105 Hornbake Building
College Park, MD 20742
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kcogdill@wam.umd.edu
Appendix H: Analysis of qualitative data from LIS directors’ and institutional administrators’ questionnaires

1. Performance Measures

Offered in response to questionnaire #16: “Please describe the 3-5 most meaningful measures that you could use to evaluate the library’s contribution to the organization.”

**LIS Directors**

**Use**
- Hits on library web page
- Physical library visits
- Number of information requests
- Number of staff/user transactions
- Number of interlibrary loan requests
- Collection use
- Hits by electronic resource used
- Inclusion of library instruction in curriculum
- Number of attendees in instructional courses
- Management/administration use of library
- Assistance in the formulation of research needs
- Repeat use by patrons
- Use by all departments, including administrators
- Ability of users to use resources effectively
- Use of computers in the library

**Circulation**

**Purpose and outcomes of use**
- Clinical decision-making
- Improved patient care
- CME hours awarded for instruction
- Creating/modifying/implementing best practices
- Cost reduction
- Risk management/reduced medical errors
- Research funding/productivity
- Reduce costs of finding biomedical information

**Satisfaction/user data**
- User surveys
- Informal feedback from users
- Recommendations/referrals to other employees by users
- Satisfaction with resources
- Satisfaction with relevance/quality of search results
- Satisfaction with services
Satisfaction with timeliness
Knowledge of employees about library services/resources
Number of patients referred to the library
Evaluation of instructional courses by participants
Focus groups
Administrator’s perception of return on investment
Absence of complaints

Library staff
Knowledge of EBM resources/provision of best evidence
Knowledge of technology/keeping up with changes
Maintaining communication with other staff members
Discernment of quality information sources
Identify and disseminate new medical information
Literature search skills
Providing better access to biomedical information
Trust and confidentiality with users
Maintaining good relationships with other libraries/sources of information

Quality of service
Accuracy of responses/relevance of search results
Response time for reference requests
Response time for interlibrary loans

Collection/resources
Availability of evidence-based resources
Sources meet user needs
Intranet provides ubiquitous access to library services
Availability of new technology
Current information sources abundant and available
Response to acquisition requests
Quality of source selection (Brandon Hill list)

Organization
Library presence in institutional annual report
Budget support of library/protection from budget cuts
Library staff representation on committees/invitations to participate
Favorable accreditation results
Involvement of library in hospital programs
Number of peer-reviewed papers published by organizational employees
Involvement in planning/implementing organizational programs
Participation in fundraising activities
Building organizational culture that values information
Library’s reaching financial goals
Impact on human resources – recruiting and job satisfaction
Promoting life-long learning
Other
Benchmarking for services and resources
Assessment resources – Libqual, AAHSL, cost metrics
Outreach to underserved populations

Institutional Administrators

Use
Physical library visits
Use by medical staff, house staff
Search requests
Electronic access counts
Number/hours of training/education programs provided by library staff
Interlibrary loans performed
Number of requests for new materials
Clinical outcomes associated with use
Use of consultation services

Satisfaction/user data
User surveys
Faculty satisfaction in support of education
Students’ and residents’ reports of library staff
Student and faculty awareness of library’s offerings
Frequency of failures to find information
Survey of grant applicants regarding their use of LIS

Library staff
Library staff’s availability and expertise
Library staff’s involvement in the larger organization
Library staff’s knowledge of the institution’s educational objectives

Collection/resources
Availability of up-to-date resources
Comparison with national standards
Deployment of information technology to ensure accessibility

Library as place
Hours open
Assessment of library’s physical environment

Other measures
Amount of research funding brought in by/targeting library or library staff
Contribution to accreditation
2. Methods of Communicating

LIS directors offered the following responses to questionnaire #17: “Please describe the 3 most effective ways that the library’s contributions to the success of the organization can be communicated.”

Methods

Media
- Newsletters: library, institutional, targeted population
- Web: links to library page, advertising library services, presence on Internet/Intranet
- E-mail: library news, collection information
- Personal contact/informal
- Exhibitions
- Listservs
- Bulletin boards/displays
- Closed-circuit television messages

Publicity/Marketing
- Fairs for organizational employees showcasing the library
- Brochures and pamphlets
- Physician orientation brochure
- Public relations initiatives/press releases
- Posters
- Promotions (e.g., coffee mugs)
- National news, major journals

Involvement in Organization
- Presence on key committees
- Maintain direct interaction with academic and clinical departments regarding library services
- Liaison programs with faculty
- Employee orientation
- Direct participation in clinical programs
- Direct participation in educational programs
- Direct participation in research programs
- Library committee with members of other departments
- Presentations to physicians
- Sponsorship of organizational events
- Participating in organizational retreats
- Outreach programs
- Survey of patrons
- Demonstrations of new services
- Sponsor satellite teleconferences

Communication with Administration
- Reports: annual, monthly, verbal
Presentations to leadership (regular, at budget meetings, etc.)
Usage statistics
Send regular updates
Library business plan communicated/integrated into overall organizational mission
Library minutes shared with senior staff
Establish direct reporting to senior administrator
Participate in strategic planning process
Presentations to alumni committees
Written reports to stakeholders

Strategies

Contribute to meeting accreditation standards
Ensure that the library is responsive to needs of organization
Contribute to organizational publications
Serve as technology resource: teaching, serve as institutional webmaster
Contribute to grants/funding through information support
Generate grant proposals
Provide literature search services for best practices
Ask physicians to spread the word about library’s positive impact on patient care
Provide current awareness services
Be highly visible and offer proactive services
Be available
Contribute to recruitment of faculty/students
Use mission-based management in library
Serve as clinical medical librarians – grand rounds, morning reports, meetings
Assist in evaluating resources
Provide effective web-based tools
Update Web site frequently
Provide access to current resources
Provide regulatory/legal info
Provide quality patient/family information
Work with quality assurance department
Offer services beyond traditional library services
Appendix I: Public services offered by libraries

The following is a list of public services offered by libraries in hospitals and academic health sciences centers. Though technical services are essential for quality patron service and smooth library operation, this list of services includes those accessed directly by users.

This list is intended to give examples of common library and information services (LIS) and is not comprehensive. Services identified as part of a data gathering effort should be appropriate to a specific environment.
Reference/consultation services

Location/Methods
- Reference/service desk
- Telephone reference
- E-mail/virtual reference
- Clinical rounds (clinical medical librarian services)

Content
- Providing information in response to specific requests
- Assistance with using print resources
- Assistance with database searches, including evidence-based retrieval
- Assistance with using other computing resources (e.g. PDA applications, PowerPoint, EndNote, statistical software, WebCT, BlackBoard, etc.)
- Assistance with accessing e-journals/e-books
- Assistance with locating materials in the library
- Assistance with remote access to library resources
- Consultation on the development of Web pages
- Mediated database searches
- Filtered retrieval from mediated searches
- Assistance with the evaluation of Web sites providing health information
- Verifying bibliographic citations
- Assistance with the development of grant proposals
- Referrals to other libraries or information agencies
- Research consultation

Current awareness services
- Clinical alerts and selected dissemination of information (SDI) services
- New acquisitions lists
- News section on library Web site

Training/education
- Classes/group education
- One-on-one training
- Curriculum liaison services
- Assistance with the development of online course content
- Assistance with copyright permissions
- Tours/orientation
- Displays/exhibits
- Assistance with patient/family education
- Community outreach such as exhibits at health fairs

Access to materials
- Access to full-text resources
- Circulation of materials
- Collection development/acquisitions
- Document delivery
- Interlibrary loan

Appendix I
Access to databases and other Web-based resources
   End-user searching (unmediated)
   Online catalog
   Subject guides
   Resource recommendations/links
   Tutorials (on using resources, software)
Support services
   Maintain/lend AV equipment/computer equipment
   Access to computer lab/computing resources
   Archives/records management
   Publication support – i.e. editing references, proofing text
   Photocopy services
   Provide meeting/study rooms
Appendix J: Sample matrix survey aligning library and information services with organizational goals

Matrix Survey Instructions

This is a matrix-style survey that asks you to think about how the library contributes to the goals of your organization.

In the first column, there is a list of organizational goals and next to it, a list of ways that the library may contribute to these goals (e.g. GOAL: Promote clinical learning; LIBRARY CONTRIBUTION: Inform users about current developments in clinical practice). Horizontally, there is a list of services offered by the library, such as reference services and user instruction.

Consider, in your personal experience, whether each of the library services supports each contribution. For example, think about whether having access to databases has helped keep you informed about current developments in clinical practice.

Circle the number that corresponds to your personal experience (see example below):
5 = The service has contributed significantly
4 = The service has contributed somewhat
3 = Neutral
2 = The service has contributed minimally
1 = The service has not contributed at all

EXAMPLE:

<table>
<thead>
<tr>
<th>ORGANIZATIONAL GOALS</th>
<th>CONTRIBUTIONS OF LIBRARY</th>
<th>LIBRARY AND INFORMATION SERVICES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Access to Databases</td>
<td>Access to Materials</td>
</tr>
<tr>
<td>Promote Clinical Learning</td>
<td>Inform users about current developments in clinical practice</td>
<td>5 4 3 2 1</td>
</tr>
<tr>
<td></td>
<td>Provide new knowledge and substantiate prior knowledge about clinical practice</td>
<td>5 4 3 2 1</td>
</tr>
<tr>
<td>Provide an Organizational Learning Environment</td>
<td>Provide information about developments in information technologies and resources</td>
<td>5 4 3 2 1</td>
</tr>
<tr>
<td></td>
<td>Support professional development of staff</td>
<td>5 4 3 2 1</td>
</tr>
<tr>
<td>ORGANIZATIONAL GOALS</td>
<td>CONTRIBUTIONS OF LIBRARY</td>
<td>LIBRARY AND INFORMATION SERVICES</td>
</tr>
<tr>
<td>-----------------------</td>
<td>--------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td></td>
<td>Access to Databases (e.g. EBM resources, MEDLINE)</td>
<td>Access to Materials (e.g. interlibrary loans, checking out materials)</td>
</tr>
<tr>
<td>PROMOTE CLINICAL LEARNING</td>
<td>Inform users about current developments in clinical practice</td>
<td>5 4 3 2 1</td>
</tr>
<tr>
<td></td>
<td>Provide new knowledge and substantiate prior knowledge about clinical practice</td>
<td>5 4 3 2 1</td>
</tr>
<tr>
<td>PROVIDE AN ORGANIZATIONAL LEARNING ENVIRONMENT</td>
<td>Provide information about developments in information technologies and resources</td>
<td>5 4 3 2 1</td>
</tr>
<tr>
<td></td>
<td>Support professional development of staff</td>
<td>5 4 3 2 1</td>
</tr>
<tr>
<td>PROVIDE RESOURCES AND SERVICES FOR TEACHING AND LEARNING</td>
<td>Provide easy and convenient access to information resources</td>
<td>5 4 3 2 1</td>
</tr>
<tr>
<td></td>
<td>Support preparation for licensing, certification and re-certification examinations</td>
<td>5 4 3 2 1</td>
</tr>
<tr>
<td>FOSTER RESEARCH</td>
<td>Support research-related needs</td>
<td>5 4 3 2 1</td>
</tr>
<tr>
<td></td>
<td>Provide information necessary to prevent duplication of research efforts</td>
<td>5 4 3 2 1</td>
</tr>
<tr>
<td>FOSTER INSTITUTIONAL ATTRACTIVENESS</td>
<td>Enhance institutional attractiveness to prospective clinical staff</td>
<td>5 4 3 2 1</td>
</tr>
<tr>
<td>PROVIDE EXCELLENT CLINICAL CARE</td>
<td>Support informed and timely clinical decision-making</td>
<td>5 4 3 2 1</td>
</tr>
<tr>
<td></td>
<td>Support the development of policies and procedures relating to clinical care</td>
<td>5 4 3 2 1</td>
</tr>
</tbody>
</table>
Appendix K: Sample user satisfaction survey

Please answer the following questions based on your experience with the library. Each question begins with a brief explanation of specific types of library services.

The questions ask you to think of library services in terms of your level of satisfaction.

1. The following question refers to access to databases provided by/through the library. These may include: access to full-text journal articles and books, MEDLINE, evidence-based medicine databases, etc.

   I am satisfied with access to the databases provided by the library.

   ![Strongly Disagree] ![Neutral] ![Strongly Agree]

2. The following question refers to access to materials in the library. This refers to checking out materials, interlibrary loans, document delivery, etc.

   I am satisfied with the access to materials provided by the library.

   ![Strongly Disagree] ![Neutral] ![Strongly Agree]

3. The following question refers to the library’s reference services. Reference services may include: assistance with database searching and evidence-based resources, research consultation, assistance with finding appropriate resources, etc.

   I am satisfied with the reference services provided by the library.

   ![Strongly Disagree] ![Neutral] ![Strongly Agree]
4. The following question refers to **training and education** services provided by the library. These may include: classes or individual instruction on how to search databases or use library resources, tours and orientations, assistance with patient/family education, participation in the educational curricula, etc.

   I am satisfied with training and education services provided by the library.

   [ ] Strongly Disagree  [ ] Neutral  [ ] Strongly Agree

5. The following question refers to **current awareness services** provided by the library. These may include: clinical alerts, a news section on the library Web site, regular updates on areas of interest (selected dissemination of information services), etc.

   I am satisfied with the current awareness services provided by the library.

   [ ] Strongly Disagree  [ ] Neutral  [ ] Strongly Agree

6. The following question refers to **support services** provided by the library. These may include maintaining and lending audio-visual and computer equipment, photocopy services, support in preparation of publication efforts, etc.

   I am satisfied with the support services provided by the library.

   [ ] Strongly Disagree  [ ] Neutral  [ ] Strongly Agree

7. The following question refers to the physical library, or the **library as a place**. This refers to the library’s study rooms, quiet reading areas, group meeting facilities, etc.

   I am satisfied with the physical library/library as a place.

   [ ] Strongly Disagree  [ ] Neutral  [ ] Strongly Agree
COLLECTION OF DATA ON USERS AND INTENDED USE

This data may be collected by incorporating the questions below into both print and electronic library forms. These may be used in forms for literature search requests, interlibrary loans, acquisition requests, evaluations of user instruction, and sign-in sheets in the library. These may be modified as appropriate to specific settings and data collection needs.

USER DATA
Please identify your position within the hospital/medical center:

☐ Physician
  ☐ Attending
  ☐ Resident
  ☐ Fellow

☐ Administrator
  ☐ Administrative Support Staff

☐ Nurse
☐ Pharmacist
☐ Allied Health Professional
  ☐ Physical Therapist
  ☐ Occupational Therapist
  ☐ Nutritionist

☐ Other clinical staff ________________

☐ Faculty
  ☐ Clinical Faculty
  ☐ Basic Sciences Faculty
  ☐ Other Faculty ________________

☐ Student
  ☐ Medical
  ☐ Nursing
  ☐ Allied Health Professional
  ☐ Basic Sciences
  ☐ Other Student _________

☐ Other clinical staff ________________

☐ Patient
  ☐ Patient Family Member

INTENDED USE DATA
Please indicate the purpose of your [SERVICE] request:

☐ Clinical Care

☐ Teaching

☐ Clinical Learning/Staying Informed

☐ Student Research

☐ Institutional Management

☐ Funded Research

☐ Patient Education

☐ Other ____________________________
SAMPLE FOCUS GROUP QUESTIONS

Refer to Appendix I, “Public Services Offered by Libraries,” for examples of specific services that may be identified. “Activity” in the questions below refers to users’ activities such as providing patient care, preparing for licensing examinations or developing a research proposal. These activities should emerge from the organizational goals most significant in a given setting.

1. Please describe an incident in which [SERVICE] has supported [ACTIVITY].
2. How can [SERVICE] be improved?
3. How can the library further support [ACTIVITY]?