Revising a standard in a time of constant change: The NISO Library Statistics and Performance Measurement Forum

Patricia Harris, Executive Director, National Information Standards Organization, USA

Denise M. Davis, Director of Statistics & Surveys, US National Commission on Libraries and Information Science, USA

Abstract

In the early-1990s when the U.S. library statistics standard was revised, the focus was on documenting or labeling input and output data consistently. Prompted by the pending review of ANSI/NISO standard Z39.7-1995, *Library Statistics*, and the need for greater understanding of the role performance indicators and outcome measures play in assessing the value of libraries, NISO took the lead in bringing together diverse constituents of the information community to begin national-level discussion on these issues. The Forum identified a need for action, and a consensus that a vision that moves libraries past the measurement of data and into assessment of performance, impact, and user wants and needs is not only desirable, but also necessary.

Environmental scan of US libraries

In the mid-1990s the United States benefited from the services provided by more than 8,900 public library systems. These comprised more than 16,000 service sites; 50 state library agencies (of which 48 have libraries servicing residents or state government employees); 3,400 higher education institutions with libraries; and 98,400 public and private schools with library media centers. In total, residents of the United States benefit from the services and resources of more than 117,700 libraries. Although the numbers of libraries remain largely unchanged, the shifts in the services, materials, and expenditures have been dramatic.

When comparing the status of libraries in the mid-1990s to today, we discover some interesting shifts in library acquisitions, the technological infrastructure required to perform basic tasks and provide basic services, and the organizational structures in which libraries operate. Libraries are major contributors to the United States economy. They expended more than $10.8 billion annually in the mid-1990s and expenditures are expected to exceed $13 billion in 2000. To emphasize this point, state library agencies reported operating expenditures of $218.2 million in 1994-95. In 1998-99 operating expenditures had risen to $949.5 million. 68% of this amount provided financial assistance to individual libraries. Capital outlay rose from $334,000 to $6.95 million during this same time period. http://nces.ed.gov/surveys/libraries/.

Journal pricing has skyrocketed in the last decade. *ARL Statistics, 1998-1999* reported a unit cost increase of 207% between 1986 and 1999. Monograph expenditures rose by 34% during this same period. The *ARL Supplementary Statistics, 1998-1999* reported an increase in expenditure for electronic serials from $11.8 million in 1994-1995 to $67 million in 1998-1999, a five-fold increase. Libraries are making information resources more widely available, but their ability to continue to do that is at stake. Libraries cannot afford to purchase the breadth and depth of information resources they used to buy, as library budgets are not keeping up with either the growth of information resources or their associated costs. http://www.arl.org/stats/index.html.

The 1980s and 1990s saw the integration of microcomputers into the routine day-to-day operations for library staff and their customers. In the 1990s the Internet became the telecommunication network for all libraries. Internet connectivity in public libraries rose from 20.9% in 1994 to 95.7% in 2000. Graphical Internet access rose from 11.8% to 94.5% during the same period. Fifty-three percent of public libraries are in rural areas. In 2000, 93% were connected to the Internet. The *2000 Internet Connectivity in Public Libraries* study revealed that 87.7% of public libraries used operating funds from local government for Internet-related technology and infrastructure expenses, 29.6% received state grants for a portion of their Internet-related technology and infrastructure expenses, and 31.4% benefited from special grants for technology and infrastructure, including the Gates Library Program. http://www.nclis.gov/statsurv/statsurv.html.

In 1994 few US libraries, regardless of type, made graphical workstations available to their customers. There are now, on average, 8 graphical public access Internet workstations per public library branch. 81% of public libraries provide public access to magazine, newspaper and other databases; 36% provide access from locations outside the library. 91% of academic libraries reporting provide access to electronic indexes and reference tools within the library and 70% reporting provide access to full text periodicals within the library. 62% of public libraries and 75% of academic libraries provide Internet-related training services. 1.7%

of Americans required adaptive technology devices in 1999. 28.8% of public libraries and 42% of academic libraries provide special hardware or software for accessing the Internet by individuals with disabilities.

Unfortunately little information on expenditures or target resources is available for K-12 school media centers, but four studies report related data. In aggregate, these studies found that 51% of public school library media centers reported that inadequate funds for technology were a "major barrier" to gaining or maximizing access to the Internet; 42% of school library media centers identified insufficient staff time as a major barrier; and only 42% of school library media centers considered "access to a network connection provider" no barrier. Other "major barriers" to Internet access reported by school library media centers included telephone lines (42%), and telecommunications equipment (38%). If these barriers were removed, and if adequate funds were made available, school media centers could be expected to join other types of libraries as major sources of access to educational materials and information, and as markets for resources in electronic format.

Prompted by the pending review of ANSI/NISO standard Z39.7-1995, *Library Statistics*, and acknowledging the changes in US libraries since the early 1990s, NISO recognized the need for greater understanding of the role performance indicators and outcome measures play in assessing the value of libraries. NISO took the lead in bringing together diverse constituents of the information community to begin national-level discussion on these issues in the context of standards, best practices and guidelines.

Executive Summary

On February 15-16, 2001 the National Information Standards Organization (NISO) organized an invitational Forum to gather information from the library community and key vendors about the best approach to evaluate the NISO standard on Library Statistics. Due for review in 2000, ANSI/NISO standard Z39.7 defines significant library input and output measures as they were collected by various organizations and agencies in the U.S. in the early 1990s.

Members of the Forum Planning Committee included Committee co-chairs Denise Davis, National Commission on Libraries and Information Services (NCLIS) and Patricia A. Wand, Library Director, American University. Committee members were Michael Gorrell, EBSCO, Martha Kyrillidou, Association of Research Libraries (ARL), Karen Motylewski, Institute of Museum and Library Services (IMLS), Barbara Perry, World Bank/IMF Library, Patricia Stevens, OCLC, J. D. Waggoner, West Virginia Library Commission, and Peter R. Young, Library of Congress (LC).

Forum participants represented academic, public, school, government, and special libraries, associations, publishers, vendors, integrated library systems and the research community.

The NISO Forum

BACKGROUND

In the U.S. every American National Standard is evaluated five years following its last approval. The NISO standard on Library Statistics, ANSI/NISO Z39.7-1995, came up for review in 2000. NISO convened this Forum to invite leaders in the field to evaluate the utility of library statistics standard and to help build a common vision of what is needed in assessing libraries and their contributions to their communities.

The Forum was designed around certain assumptions, including:

- The library community has a deep respect for standards and a long history of cooperation.

- Although the current standard for library statistics primarily counts inputs and outputs, the profession is ready to measure other indicators of productivity and quality. No standards exist for these other measurements.

- Successful standards start small and may begin as pilot projects, best practices, or guidelines that can be tested. A successful action plan will encompass phases with short-term and long-term activities.

- Many different constituents comprise the information profession and many different needs must be addressed.

The Forum participants, all of whom are involved in collecting, aggregating, contributing, or studying library data, were invited because of their demonstrated professional expertise and commitment. Participants represented every type of library: academic, government, public, school, and special, as well as associations, government agencies, vendors, and the library research community.

Participants considered a variety of approaches, including ideas for research; topics that need to be addressed; areas where standards, guidelines, or best practices are appropriate; and opportunities for NISO to collaborate with other organizations.

As an ANSI-accredited standards developer, NISO supports the development of technical standards when a standard is viewed as the best solution. NISO advocates a practical approach to standards development and that standards should not be viewed as "the perfect document." Procedures require that NISO revisit each standard five years after its approval. This "five-year review" is a chance to determine if the standard is still used. In this process NISO considers if the standard would benefit from revision; if the standard reflects current needs and practices, it can be reaffirmed; if the standard is no longer used, we consider whether it should be withdrawn or maintained as a legacy document;

For many years, NISO tradition limited this discussion to its members, but it finds more value in opening discussion to the community at large and engaging a variety of knowledgeable and interested persons to advise on next steps. NISO has used this approach successfully to explore emerging standardization issues such as the Draft International Standard (DIS) for the Digital Object Identifier (DOI); advances in thesaurus construction and design; knowledge management; and the challenges and complexities of reference linking.

All Standards are expected to change to address new needs and technologies. The Library Statistics Standard was first released in 1968, revised in 1983 and again in 1995. With each revision the Standard expanded. When the 1995 edition of the Library Statistics Standard was released the committee that developed it acknowledged that the Standard did not address two important emerging areas: measurement of electronic resources and performance measures. It was recommended that these matters be examined at the next five-year review point.

FRAMEWORK OF THE FORUM

Throughout the Forum discussion was channeled through a mixture of panel presentations, whole-group discussions, and structured breakout groups. The goal was to maximize cross-disciplinary information sharing around broad issues and to use discussion in homogeneous groups (called affinity groups) to capture the viewpoint of specific segments, for example school libraries, researchers, and vendors.

The Forum was structured around a concept map comprised of four categories of measurement and three key management functions supported by those measures.

The four categories of measurement were:

1. **Statistics –** *What we are measuring - how much we do (input/output)*
    Counting activities and resources that quantify library materials, services, staff, operations and users.

2. **Performance indicators –** *How well we do.*
    Collection and interpretation of quantitative and qualitative data pertinent to local goals and objectives as well as values and/or characteristics in order to assess service quality, performance efficiency and customer satisfaction within a specific context.

3. **Economic value –** *How much we're worth.*
    Collection and interpretation of expenditures data in relation to output production to document costs, unit costs, and economic value derived, and assign a dollar value to library products and services within a specific environment characterized by various environmental constraints and opportunities.

4. **Outcome measures –** *What good we do.*
    Evaluation of the results of program activity compared to its intended purpose. Measures relate to observable changes in knowledge, skills, behavior, attitudes, status or life condition. Quantitative measures are based on test scores, and qualitative measures are based on observations of indicative behaviors.

The three functions were:

1. **Internal decisions –** to assist with management decisions and internal specifications and policies

2. **Local advocacy –** to justify budgets and demonstrate that local goals and objectives have met the needs of the community

3. **Broad advocacy –** to identify trends, understand the larger environmental factors, promote the value of information organizations and professionals such as library and information professionals

This perspective was identified by a presenter and recognized as a useful distinction by many of the participants. During Forum discussions a fourth function emerged. There was significant discussion of the importance of *marketing* in library management.

Presentations

Two panel presentations set the stage for small heterogeneous or homogeneous group discussions. The first panel, representing academic, school, special, and public librarians, and the vendor community suggested significant current issues for measurement in libraries. The second panel presented current research and development focused on measuring the performance and value of libraries. Adverse weather conditions in the mid-Atlantic region of the US prevented some presenters from attending. As a result of good planning, some Forum planners and participants were able to make abbreviated presentations on the topics.

PANEL I: ISSUES FOR LIBRARIES – MEASURING THE INFORMATION AGE

Moderated by Peter Young, panelists were asked to address the question "Given the speed of change, how should libraries measure today what they will need to report on tomorrow?"

Eileen Hitchingham, Virginia Polytechnic Institute, asked participants to consider whether data was being collected "to show" administrators for budget justification or "to know" – for use by library management.

Ann Weeks, College of Information Studies, University of Maryland, noted that no national data about school libraries is being collected. She pointed out that it is difficult to make compelling arguments for school libraries without data. Weeks also noted that

information literacy skills begin with school libraries, so life-long information literacy and effective library use is dependent on the success of this building block.

Susan Fifer-Canby, National Geographic Society Library, suggested that library staff should be treated as assets rather than expenses. She pointed out that special libraries are well positioned to facilitate organization wide conversations.

Mark Smith, Riverside (California) County Library System, suggested that libraries have not been fundamentally changed by technology. Rather, he noted, it is users' expectations and patterns of using library information resources that have changed dramatically.

Michael Gorrell, EBSCO Publishing, emphasized the importance of statistics. His early work in engineering demonstrated that "without data, you are just another person with an opinion."

PANEL II: CURRENT RESEARCH

Denise Davis moderated the panel on research conducted in academic, public, and school libraries to develop tools that provide data on a variety of measures of library services and their value.

Fred Heath, Texas A&M University, described the development and testing of LibQUAL+, a protocol adapted from the business community, to assess service quality in academic libraries. LibQUAL+, funded in part by the Fund for the Improvement of Post-secondary Education (FIPSE), U.S. Department of Education, maps how well the level of service delivered matches user expectations, based on what users find important.

Denise Davis gave the presentation of John Bertot and his colleagues at Florida State University. Bertot is the lead researcher for two important ongoing studies. The first project is jointly sponsored by IMLS, NCLIS, and NISO. This work defines electronic network performance measures that can be collected at the national level for public libraries. The second project, sponsored by ARL, explores e-metrics for research libraries, suggests measures for the use of electronic resources, and develops a framework of outcomes assessment in relation to the use of electronic resources.

Karen Motylewski delivered a presentation for Keith Lance, State Library of Colorado. Funded in part by IMLS, Lance has documented the positive relationship of student performance and strong school library/school media center programs in Alaska, Colorado, Pennsylvania and Oregon.

Christie Koontz, Florida Resources and Environmental Analysis Center, Florida State University (FSU), described her research in collecting in-library use statistics. In the most recent project, Keith Lance joined Ms. Koontz and Dean Jue of Florida State University as co-principal investigators in developing a model for using portable technology (PDAs) to assess use of the public library in majority, minority, and low-income settings. This project updates "Counting on Results" and is funded by a grant from IMLS.

An informal report was given by Jeffrey Owings, Associate Commissioner, National Center for Education Statistics (NCES). Owings provided information about the national Library Statistics Program and a longitudinal study of 10th graders in the U.S. that includes data about library media centers.

All presentations are on the NISO website at http://www.niso.org.

GENERAL THEMES, DISCUSSIONS AND COMMENTS FROM PARTICIPANTS

Throughout the Forum, common themes emerged around the topic of how to demonstrate the value that libraries contribute to their communities.

- There is critical need for systemic data collection. With all sectors of the industry represented in the Forum, discrepancies in the availability of accurate, current, national data for essential library services within key segments became rapidly apparent. The lack of information about school libraries may be the type example.

- There is a pressing need for guidelines for collecting qualitative and performance data. The community is ready to move beyond statistics into measures that tie the value of libraries more closely to the benefits they create for their users. Changes in the technology of library services and the competitive climate for resources require libraries, librarians, and even NISO, to understand better how to market themselves to a variety of audiences.

- Librarians need tools to collect and interpret qualitative data to "tell their story" more effectively. There is recognition that libraries need more than input/output data. New tools are needed to convey the value of libraries to their users and funding agencies.

- The increased use of technology in library operations requires different skill sets than were necessary a decade ago. Systematic training needs to be available to working librarians to develop the skills to assess, manage and promote their organizations.

- Different methodologies are evolving to measure network performance (NCLIS), service quality (e.g. ARL's LibQUAL+), impact, and economic value. Additional research is needed to develop new tools and approaches for practical application by the library community.

- There is support for the development of a "data dictionary" of terms in frequent use by different constituencies. The definition and meaning of terms can vary greatly, and a common vocabulary is necessary to understand the data being

collected and presented.

- NISO can also serve as a clearinghouse for guidelines, standards, benchmarks, and best practices. In a rapidly changing environment, a variety of flexible tools are needed to facilitate coordination of developments throughout the industry. NISO is well positioned to develop a "data dictionary" of terms in use by different constituencies and to make this document available on the web. Given its pivotal role in the industry, it was suggested that NISO could facilitate the cross-sector collaboration necessary to evolve the most useful working documents.

A summary of discussion and comments from Forum participants follows.

- Caution was offered in data interpretation. For example, a decrease in number of searches conducted may reflect increased efficiency and higher user satisfaction rather than less use and lower value.

- The user's universe is changing in fundamental ways that affect how information is located and used.

- Libraries are beginning to develop customer-oriented assessment tools focused on user satisfaction, service quality, and outcomes.

- Libraries need new tools and best practices to assess user behavior.

- Expectations for customer service standards can be operationalized as "every user has the right to…."

- The psychographics of subgroups (understanding how/why certain segments behave) can offer insights in developing customized services to meet specialized needs. (e.g. "minit markets")

- With the advent of electronic resources, physical collections are less apparent but stable while digital collections may be more apparent, yet not stable.

- Measurement might more accurately focus on the activity of librarians rather than the activity of the library.

- Workload measures (e.g., how many interlibrary loan requests can be handled in one hour) are needed to establish parameters for staffing.

- Guidelines are needed to determine when to collect whole-universe data vs. sampling.

- The more libraries work with unified standards, the more likely they are to be heard.

- Guidelines and tools are needed to assess users' needs, satisfaction and competency.

The discussion groups agreed that NISO might play a bigger role to:

- Bring constituencies together to learn abut the work of other stakeholders, to build on that base, and reduce duplication of effort.

- Serve as a clearinghouse for standards and guidelines across diverse communities with related interests.

- Move beyond defining data elements to provide guidelines and methodologies for qualitative as well as quantitative measurement.

- Support the development of surveys, measurements, and other resources for measuring service quality and outcomes.

- Offer training for the industry on what to measure and how it can be measured.

- Explore tools such as ISO 9000 and the Baldridge Award program for application to the library and information industry.

- Create a publication series, with best practices identified as one desirable focus.

Recommendations

Many of the discussion groups agreed that NISO is well positioned to play a bigger role to:

- Facilitate cross-constituency information sharing, enabling specialized stakeholders to build on the work of others and to avoid duplication of effort.

- Serve as a clearinghouse for standards, guidelines, and other tools across diverse communities with closely related interests.

- Move beyond defining data elements to provide methodologies for qualitative as well as quantitative measures of library service.

- Support the development of surveys/measurements for service quality and outcomes.

- Offer training for the industry on what to measure and how to measure it.

- Explore tools such as ISO 9000 and the Baldridge Award for application to the library and information industry.

- Create a best practice publication series.

Evaluation

Attendees were invited to evaluate the Forum. Overall attendees' comments were positive. Many noted their own discovery process, learning from colleagues and developing an appreciation of the need for guidelines within the industry.

Conclusion

In the early-1990s when the U.S. library statistics standard was revised, the focus was on documenting or labeling input and output data consistently. The Forum identified a need for action, and a consensus that a vision that moves libraries past the measurement of data and into assessment of performance, impact, and user wants and needs is not only desirable, but also necessary.

This Forum enabled a broad, diverse group of stakeholders to explore their requirements and vision for describing, measuring, and showing the significance of contemporary library services. Forum discussions confirmed that libraries and related organizations have a critical need to demonstrate concretely the value they bring to the communities they serve.

Forum participants agreed that NISO played a critical role in bringing all constituencies together. NISO was seen as a rare "honest broker" – an objective agent for sharing information across traditional boundaries to enable each constituency to build on the work of others and reduce the duplication of effort.

Developments since the Forum

The NISO Standards Development Committee met on July 9, 2001 and reviewed action items from the Forum. Approval was given to proceed with three components as part of an overall framework for NISO work in the area of statistics and measurement:

1. Revise and expand ANSI/NISO standard Z39.7-1995, Library Statistics. The approach a committee will be tasked to: review the standard and identify gaps; review existing survey instruments and identify gaps. The goal is to have Z39.7 reflect current survey instruments. Plans are to convene a working group in fall 2001 with representation from the library, research and vendor communities.

2. Develop a web accessible "data dictionary", a working thesaurus of related terms for statistics, measurement, e-metrics and usage statistics. This data dictionary would encompass Z39.7. Drs. Charles R. McClure and John Carlo Bertot (FSU) will work with NISO to compile and maintain the data dictionary.

3. Assess the role of performance indicators and measures in the suite of NISO standards and guidelines. NISO recognizes that the area of performance measures continues to evolve and, at present, is too unstable to accommodate a standard. The goal is to develop a guideline or a best practice in this area. A partnership approach is planned and the following groups have been identified as potential partners: The Association of Research Libraries (ARL), Institute of Museum and Library Services (IMLS), American Library Association (ALA), Special Library Association (SLA), Association of Library and Information Science Educators (ALISE), and Urban Libraries Council (ULC).

Since the NISO Forum there have been ongoing discussions in the library and publishing communities regarding vendor-based usage statistics. The International Association of Science, Technology, and Medical Publishers (STM) sponsored a workshop on usage measures and statistics in April 2001. The Association for Research Libraries continues its multi-year effort in the area of library performance measures and service quality. Efforts in the UK are through the Joint Information Statistics Committee, Vendor-based usage statistics for online journals and databases, a group currently led by Richard Gedye, Oxford University Press. A working group was set up in 2000 under the auspices of PALS – the Publishers and Libraries Solutions group of the UK Publishers' Association (PA), the Association of Learned and Professional Society Publishers (ALPSP) and the Joint Information Systems Committee of the UK further and higher education funding bodies (JISC). The Working Group on Vendor Based Statistics has looked at the variety of very useful work that has been conducted in this area over the last year and is now working toward a common code of practice.

It is evident that the work in this area continues to evolve, and defining and developing national standards of measure is but one part of the effort. The following is a brief list of valuable websites to consult regarding network performance and service quality measures.

Further Information

Association for Research Libraries, information about research and statistics projects http://www.arl.org/>

Bertot, John Carlo. Florida State University, vendor-based usage statistics <http://slis-two.lis.fsu.edu/~jcbertot/>

Institute of Museum and Library Services (IMLS) <http://www.imls.gov>

International Association of Science, Technology, and Medical Publishers (STM) <http://www.stm.com>

Joint Information Statistics Committee (JISC), Vendor-based usage statistics for online journals and databases. <http://www.jisc.ac.uk/curriss/collab/c6_pub/uswg/>

McClure, Charles R. Use statistics and network performance measures in public and academic libraries. <http://slis-two.lis.fsu.edu/s~cmcclure/>

National Information Standards Organization <http://www.niso.org>