



CARL/ABRC Backgrounder Series # 3

Statistics and Performance Measures for Research Libraries

Recent Research and New Developments

January 2002

By Kathleen Shearer

Statistical data about library activities has always provided important information to library managers. Performance and output measures contribute to increasing service quality; making purchasing decisions; as well as benchmarking tools to identify best practices. At the *2001 NISO Forum on Performance Measures and Statistics*, attendees identified three management functions that are supported by library statistics and measures: To assist in internal decision making (purchasing, staffing, etc); to justify library budgets and activities; and, to identify broader trends in the use and value of information and libraries.¹ In the current climate, library statistics have become even more imperative. Governments and educational institutions are emphasizing the need for research libraries to both demonstrate outcomes in areas important to the institution and to maximize the use of resources, necessitating new approaches that can provide more direct links between performance measures and their institutional outcomes. The purpose of this document is to describe several of the major research initiatives into the development of new measures and analytical tools for library statistics, and briefly outline the current standards for the collection of academic library statistics. You will find an Appendix at the end of the document that provides more details and contact information about the various organizations and projects discussed here.

Current standards for the collection of aggregate statistics in academic libraries are outlined by the International Standards Organization (ISO 11620 and ISO 2789) in Europe and the National Information Standards Organization (ANSI/NISO Z39.7) in the United States. These standards identify and define the basic data collection categories used to collect library statistical data at the national level. Standards include specific measurements for academic libraries and are intended to provide valid and comparable data on library services, staff, users, and collections.

ANSI/NISO, which revises its standards every five years, began its revision of *Z39.7-1995 Library Statistics Standards* in 2000. According to contributors to the 2001 NISO forum, the 1995 edition of *Z39.7* relied too heavily on collecting inputs and outputs, and was thought to be insufficient in two major areas: the measurement of electronic resources; and the measurement of service quality [NISO Forum on Performance Measures and Statistics for Libraries, 2001]. The Library Statistics Standards Committee, which is assigned the task of revising the base standard and making recommendations, will be incorporating new and improved measures developed by other organizations and plans to have the updated standards available for comment no later than July 1, 2002.

While many organizations base their surveys on these standards, the statistics collected by the various local, national and international associations varies, depending on organizational purpose and budgetary concerns. In the US, the ARL has collected statistics from its members for the better part of the 20th century. These measures are meant to assist libraries managers in describing their library's inputs and outputs and in measuring their performance over time for benchmarking with peers as well as improving their own operations. The National Center for Education Statistics (NCES) collects data biennially from 3,500 post-secondary institutions in the US, in order to provide an overview of academic libraries nationally and by state. The purpose is to use the data to effectively plan for the development and use of post-secondary education library resources in the United States including allocation of federal funds, for regional and national comparisons of library resources and to determine the status of academic library operations and the profession. UNESCO collects international data for the purpose of broad national comparisons. UNESCO, which collects its library statistics based on standards outlined by the ISO, often has difficulty obtaining complete statistics, especially from developing countries where there are little or no resources allocated to academic libraries, let alone gathering statistics (UNESCO, Division des statistiques, 1994).

The LibEcon2000 project in Europe was an attempt to standardize the collection of library statistics at the international level and expand on the existing ISO standards to provide a more complete picture of library activities in participating European countries. LibEcon2000, which originally collected library statistics from various sectors for 30 European countries, was expanded in 2001 to include Australia; Canada; Korea; New Zealand; USA; Japan; Mexico; Turkey and Russia. Funded by DG13 of the European Commission within the Telematics Applications Programme, **LibEcon**, will collect at least 5 years data from the new countries and 3 years new data will be added for LIBECON2000 countries. This pilot project aims to gather consistent international information about the part played by libraries in developing information resources within Europe, and internationally, for the purposes of benchmarking and advocacy. The project also examines the feasibility of assembling such information via the web. The goal is to build on existing standards, ISO 2789 [International standard on library statistics] and ISO 11620 [Library Performance Indicators]. LibEcon has expanded the UNESCO questionnaire, which is based on ISO standards, to include information about electronic resources as well as detailed information about library expenditures. [LibEcon, 2002].

Library standards organizations recognize the need to broaden the range of definitions in order to reflect recent technological developments. This was reflected by the numerous research initiatives presented at the *4th Northumbria International Conference on Performance Measurement in Libraries & Information Services* held in August 2001, highlighting the increasing demand for new measures and statistical methods for libraries. Current studies in this area tend to fall into one of four categories: (1) The development of new aggregate measures for electronic resources; (2) the development of standardized methodologies for the measurement of electronic journal and database use; (3) the development of new measurements for library services; and (4) the development of new data analysis tools for library statistics.

A major challenge for research libraries in the new digital environment is the collection of statistics about electronic resources. It is obvious that new technologies are changing library services, as well as the nature of library use. However, without reliable methods for tracking these trends, librarians are helpless to formulate “critical and appropriate responses to widespread, rapid changes in higher education”ⁱⁱ. The Digital Library Federation (DLF) has become increasingly concerned by the absence of reliable information with which to document and explain changing patterns of library use in universities and colleges. DLF repeatedly hears from academic library directors that such analyses are vital but missing ingredients of their strategic planning and of the business case they make to faculty and senior administrators either to win or bolster support for the library and its changing directions.ⁱⁱⁱ In recent years, several organizations have begun to develop new, more accurate measures for electronic resources in libraries. The International Coalition of Library Consortia (ICOLC) has recently published updated **Guidelines for Statistical Measures of Usage of Web-based Information Resources**. The 2001 revision is intended to provide a practical framework for libraries and vendors in which to deliver usage statistics in the current environment. The update improves on several aspects of the 1998 guidelines by simplifying the data elements to be reported, and strengthening administrative aspects of confidentiality, access, delivery, and report format. The guidelines for measuring electronic resources do not provide collection methodologies or definitions, but merely outline what consortia members identify as minimum requirements for data elements, such as number of sessions, number of queries, etc.; data confidentiality, access, and delivery guidelines; and recommended reporting formats.

A more in-depth study was conducted by the ARL as part of its New Measures Initiative. The aim of the **E-Metrics Project**, conducted in 2000/01, was to provide research librarians with

important techniques to count, describe, and report networked services and resources in their libraries. The study is characterized as “a beginning approach, for describing and measuring some of the resources, uses, and expenditures for supporting networked services in a research library setting”^{iv}. The new measures developed in this project are more extensive than those put forward by the ICOLC, and are accompanied by collection methodologies and precise definitions for data sets. Based on field tests conducted in 16 libraries, the study outlines a number of network statistics and performance measures that provide indicators of library networked services and resources. The study recommends collection of statistics in 4 areas: (1) Patron accessible resources – Number of electronic full-text journals, Number of electronic reference sources, and Number of electronic books; (2) Use of electronic resources and services – Number of electronic reference transactions, Number of logins (sessions) to electronic databases, Number of queries (searches) in electronic databases, Number of items requested in electronic databases, and Virtual visits to library’s web site and catalog; (3) Expenditures for networked resources and related infrastructure – Cost of electronic full-text journals, Cost of electronic reference sources, Cost of electronic books, Library expenditures for bibliographic utilities, networks, and consortia, and External expenditures for bibliographic utilities, networks, and consortia; and (4) Library digitization activities – Size of library digital collection, Use of library digital collection, and Cost of digital collection construction and management. These statistics are indicators in themselves, but also contribute to the calculation of three other major performance measures: (1) Percentage of electronic reference transactions of total reference transactions; (2) Percentage of virtual library visits of all library visits; and (3) Percentage of electronic books of all monographs.^v

A third research endeavor into measuring electronic resources, conducted between 1998 and 2000 by Centre for Research in Library and Information Management (CERLIM) at Manchester Metropolitan University & 6 other European partners, is the **EQUINOX** project. The major aim of EQUINOX (Library Performance Measurement and Quality Management System) was to further develop existing international agreements on performance measures for libraries (ISO 11620), by expanding these to include performance measures for the electronic library environment. After extensive consultation with the professional community, the members of EQUINOX agreed upon 14 electronic library performance indicators. As with the ARL E-metrics project, the data sets are accompanied by precise definitions of terms, and collection methodologies. The EQUINOX performance indicators differ from those outlined in the ARL E-Metrics project slightly, omitting questions about library digitization, but including questions about library training sessions and staffing for electronic resources. EQUINOX performance

indicators include: Percentage of the population reached by electronic library services; Percentage of information requests submitted electronically; Number of library computer workstation hours available; Number of attendance's at formal electronic library service training lessons; Number of library staff developing, managing and providing ELS and user training; as well as usage and expenditure data.^{vi} The performance indicators were tested by library partners in the EQUINOX project in their own real library situations in terms of ease of data collection, applicability to the current situation in the library, relevance to library management, etc. Both the feedback received and the testing of the PIs showed that some further revision of the PI list was required.

While the collection of aggregate statistics about electronic resources plays an important role in library benchmarking and understanding broader usage trends, there are some very strong caveats inherent in their value as performance indicators (Goldberg, 1998; Haigh and Megarity, 1998). Log files were actually designed to help network administrators gauge traffic on a site, not to judge how people use a site. The number of "sessions" or "hits" on a web site or web page does not necessarily represent number of users, and similarly, a decrease in number of searches conducted may reflect increased efficiency and higher user satisfaction rather than less use and lower value (NISO, 2001). One must be careful about drawing conclusions about how networked electronic resources are being used from this type of data. Both publishers and librarians must remain aware that measures of the level of activity do not necessarily indicate the value of an article (Luther, 2001).

Another issue of immediate and pressing concern for many librarians is the development of standardized methodologies for the collection of statistics on the usage of individual electronic journals and databases. Electronic journals represent a significant and growing part of the academic library's offerings (CARL, 2000). In the absence of detailed data about their usage, librarians are unable to make key decisions related to acquisitions and subscriptions, such as "Is the price of the electronic copy justified by its use?" and "Which journals and databases are highly used and which are not?"(Luther, 2000). Reliable, consistent, and compatible online usage statistics are an urgently needed essential resource for both vendors and users. To a large extent, libraries are dependent on the publishers of these types of electronic materials for this data. Libraries can tell which Web sites users are going to for information, but once users reach the publisher's site, their activity can be tracked only by the publisher. Unfortunately, it has been very difficult for librarians to obtain meaningful usage data from the publishers of electronic journals. The reason is not a simply matter of publishers being unwilling to provide such information

(although publishers do complain that data collection is costly and could provide information of low usage^{vii}). More importantly, when usage statistics are provided, each vendor implements a different measurement methodology for their collection, leaving little room for comparison amongst resources provided by different vendors.

In order to tackle these issues, the Publisher and Libraries Solutions Committee (PALS), **Vendor-Based Usage Statistics Working Group** was formed by the UK-based, Joint Information Systems Committee, in conjunction with members of the publishing community (the Publisher Association and the Association of Learned Professional Society Publishers). The aim of the group is to develop a code of practice for vendor-based electronic journal and databases usage statistics. The measures being examined by the PALS Working Group are, in large part, based on research conducted by the projects described earlier and the major objective is to achieve a consensus between members of the library and publishing community about a standardized set of measures for gathering statistics on electronic resources. The code of practice will be comprehensive and include guidance on: Which data elements should be measured; Definitions of these data elements; Output report formats /frequency /granularity; Methods of delivery; Methods of combining usage reports from direct use and from use via intermediaries - including gateways, aggregators, and electronic document delivery vendors; Methods of measuring remote usage of institutionally licensed products; Methods of measuring usage from caches and mirrors. In June 2001, the Working Group held an international forum in London to discuss their draft proposals for a Code of Practice on vendor-based usage statistics. Draft data elements were categorized as either inputs or outputs. Inputs include: Page views; session data; market elements; and data processing. Outputs include: Format; minimum basic data subsets/reports; delivery method; and searches. The measures put a strong emphasis on collecting details about “page views” such as bibliographic information; IP address; and access time among other. At the forum, the 55 representatives from the vendor, standards, and library communities came to agreement on a substantial number of the data elements and their definitions, as well as on matters of output and delivery. However, a significant number of issues remained unresolved on that day. As a result, six sub-groups were formed to undertake further work on understanding and resolving these outstanding issues to be disseminated sometime in 2002 (PALS Usage Statistics Working Group, 2001).

Another aspect of library statistics, which has garnered interest in the research community, is the development of new methodologies for measuring service quality. Academic

libraries need these measures to ensure a basic level of service quality, as well as to answer the rising demands for accountability by university administrators and government agencies. Current measures are thought to be insufficient for several reasons. First of all, current measures of service quality rely to a large extent on expenditure levels. This relationship, although widely assumed, has not been empirically proven and are unable to answer new demands for evaluation and accountability of library services (Cook, 2001). Secondly, new technologies used in library services have made traditional collection methodologies for statistics on library services obsolete (NISO, 2001). The major research project this area, **LibQUAL+**, is a collaborative effort between the Association of Research Libraries (ARL) and researchers at Texas A&M University. The LibQUAL+ instrument was developed to assess service quality among research libraries and is patterned after the SERVQUAL, a protocol developed for the for-profit sector in the 1980's. Through a web-based survey, LibQUAL+ asks respondents to provide assessments of expectations of service on three scales: desired, perceived and minimum evaluations. For each question, gap scores are calculated between minimum and perceived expectations and desired and perceived expectations. The zone of tolerance is the difference between the minimum and desired scores. Optimally, perceived performance assessments should fall comfortably within that zone. Initial field tests of a 25-item LibQUAL+™ survey yielded reliable scores on 4 scales: Service Affect, Library as Place, Personal Control, and Information Access) as well as on the total scale (Cook and Thompson, 2001). LibQUAL+ will continue as an R&D endeavor through 2003, by which time it will evolve into an ongoing service quality assessment program at ARL (Cook, 2001).

Not only do librarians need standards to define data sets and methodologies for collecting that data, but also equally as important is the development of tools to interpret this data. The ultimate value of any statistics is in how the data is analyzed and eventually put to use. Many fear that despite the fact that most libraries gather statistics, the data that is gathered, is often not analyzed nor put to use. The development of new tools to facilitate analysis of statistical data may help to increase in its usability. Initiatives to facilitate cost-analysis are of current interest as pressure grows on libraries to justify expenditures.

One such tool, called the **Balanced Scorecard**, is an adaptation of management software for use in academic libraries, sponsored by the German Research Council. The tool, which was originally designed for use in the business arena, translates the planning perspective of an institution into a system of indicators for four main areas of library performance: finances, users,

internal processes and improvement activities. One of the key functions of the Balanced Scorecard will be to visualize cause and effect relationships between target values, evaluation data and actions taken. The Balanced Scorecard is still in field-testing and results will be published in a handbook including software that will enable academic libraries to establish an integrated controlling system and to collect and evaluate performance as well as cost data for management decisions (IFLA, 2001).

The University of Newcastle in Australia and Ernst & Young conducted another large cost-analysis study during the first half of 2000. In 1993, the Australian government announced that its funding for academic institutions may eventually be based on their performance as defined by unit cost. This has resulted in an investment by various Australian universities in the development activity based costing models and methodologies. The **Costing Methodology for Library and Information Technology Activities for the Australian Higher Education Sector** study used a costing methodology already developed by the Australian government. Main objectives were to review of costs associated with library and information technology activities; evaluate the appropriateness of the Activity-Based Costing methodology to library and information technology activities within the Higher education; provide a benchmark for use of the model across the higher education sector; and gain a better understanding of indirect costs involved in library and information technology activities. The study resulted in a cost per activity analysis of each activity performed in the library and IT departments and has been used as the basis to review or evaluate activities and particular approaches within the program (Information and Education Services Division, The University of Newcastle, 2001).

And finally, an interesting study, though smaller in scale than the others, is being conducted to compare the cost and performance of print and electronic journal titles in UC Davis libraries at the University of California, Davis Campus. This **Cost/Performance of Print vs. Licensed Electronic Journal Titles** is ongoing and will provide measurements on the effects of some of these shifts in format on the use of materials throughout the collections. In addition, the combination of data elements and likely results will provide a unique contribution to the research at this time, enhance community understanding and provide needed opportunity for perspective from colleagues in a broad range of institutions [4th Northumbria International Conference on Performance Measurement in Libraries & Information Services, 2001].

The ultimate aim of all of these projects is to provide library managers with a greater understanding of academic library activities in order to make more informed decisions. The purpose of this paper is to provide an outline of the new statistical and performance measures being developed in the academic library milieu, however, this is by no means an exhaustive account of research into performance measures in libraries. There are many other smaller scale projects occurring internationally and several large-scale studies to develop performance measures in non-academic libraries, such as the **BIX Library Index** in Germany.

While these new measures represent significant progress in portraying a more complete picture, they do not entirely solve some of the problems inherent in the analysis library statistics. Field tests of methodologies have shown that the pilot libraries often find it difficult, expensive, and sometimes impossible to collect some of the data required (Cook, et. al, 2001; Wonsik, et. al. 2001). In an environment of soaring journal costs and shrinking buying power, library managers must weigh the cost of implementing new collection methodologies against other important budgetary concerns. In addition, the pressing issue of collection of e-journal and database usage statistics requires a significant buy-in from publishers and vendors as well as libraries. While academic libraries have an immediate need for this data to make acquisition decisions, publishers and vendors often have divergent interests. Nor, do new indicators and methodologies imply that there is less of a need to draw conclusions based on this type of statistical data with great care. Statistics continue to be only crude surrogates for what we really want to know about our libraries (CARL, 1999). This is even more so with measuring electronic resources where it is easier to make unsound inferences when analyzing sessions and log-ins than with traditional statistics (Haigh, et. al., 1998). Similarly, comparisons of data and performance indicators between institutions or between nations must be performed with caution, as definitions are often interpreted differently by individual libraries. As well, methods for counting vary and year to year comparisons should only be made if a library has reported data in the same area on a consistent basis.

That being said, the trend towards greater accountability for library spending, along with the rapid pace of technological change continues to create a need for the development of new measures. The immediate requirement for the expansion of traditional measures to provide data about the use of electronic resources is being fulfilled through the work of several organizations and new initiatives to develop more accurate measures of service quality are being welcomed. Through the development of new analysis tools and web-based surveys, eventually, the process of statistical collection for libraries will require less of a commitment from library managers while

providing the valuable information they need for decision making. Furthermore, the library community seems well disposed to move from basic statistical measures to measures that tie the value of libraries more closely to the benefits they create for their users, thus defining new research objectives for the future.

End Notes

ⁱNISO Forum on Performance Measures and Statistics for Libraries; 2001
[<http://www.niso.org/news/reports/stats-rpt.html>]

ⁱⁱ Troll, Denis; 2001 [<http://www.diglib.org/use/whitepaper.htm>]

ⁱⁱⁱ Dagar, Lynn, et.al.; 2001 [<http://www.diglib.org/use/grantpub.pdf>]

^{iv} Wonsik, et.al.; 2001, pg.iii

^v Wonsik, et.al.;2001 pg.iii

^{vi} Brophy, Peter, et.al.; 2000 [<http://equinox.dcu.ie/reports/pilist.html>]

Bibliography

4th Northumbria International Conference on Performance Measurement in Libraries & Information Services. [Online] "Meaningful Measures for Emerging Realities". Association of Research Libraries; Pittsburgh, Pennsylvania: 2001 [<http://www.arl.org/stats/north/>] Accessed on January 18, 2002.

Brophy, Peter; Clarke, Zoe; Brinkley, Monica; Mundt, Sebastian; Poll, Roswita. [Online] "Performance Indicators for Electronic Library Services" EQUINOX: Library Performance Measurement and Quality Management System; Manchester, United Kingdom: November 2000. [<http://equinox.dcu.ie/reports/pilist.html>] Accessed on January 18, 2002.

Canadian Association of Research Libraries. "1998-1999 Statistics". CARL; Ottawa, ON: May, 2000.

Cook, Colleen; Heath, Fred; Thompson, Bruce and Russel Thompson. [Online] "The Search for New Measures: The ARL LibQUAL+Project--A Preliminary Report". Libraries and the Academy 1.1, pg. 103-112: 2001. [<http://muse.jhu.edu/demo/pla/1.1cook.html>]. Accessed on January 18, 2002.

Cook, Collen and Fred Thompson. [Online] "Scaling for the LibQUAL+™ Instrument: A Comparison of Desired, Perceived and Minimum Expectation Responses versus Perceived Only". 4th Northumbria International Conference, Pittsburgh, Pennsylvania: August 14, 2001 [<http://www.coe.tamu.edu/~bthompson/libqual5.htm>] Accessed on January 18, 2002.

Dagar, Lynn; Greenstein, Daniel and Leigh Watson Healy. [Online] "Dimensions and Use of the Scholarly Information Environment". Digital Library Federation; June 28, 2001. [<http://www.diglib.org/use/grantpub.pdf>] Accessed on January 18, 2002.

Haigh, Susan; Megarity, Janette. [Online] "Measuring Web Site Usage: Log File Analysis". National Library of Canada; Ottawa, ON: 1998. [<http://www.nlc-bnc.ca/publications/1/p1-256-e.html>] Accessed on January 18, 2002.

Information and Education Services Division, The University of Newcastle. [Online] "Activity Based Costing: A Study to develop a costing methodology for Library and Information Technology Activities for the Australian Higher Education Sector". Department of Education, Training and Youth Affairs, Commonwealth of Australia: April 2001. [<http://www.dest.gov.au/highered/otherpub/libraries/libraries.pdf>] Accessed on January 21, 2002.

International Coalition of Library Consortia. [Online] "Guidelines for Statistical Measures of Usage of Web-Based Information Resources". ICOLC; New Haven, Connecticut: December 2001. [<http://www.library.yale.edu/consortia/2001webstats.htm>] Accessed on January 18, 2002.

Goldberg, Jeff. [Online] "Why web usage statistics are (worse than) meaningless". Goldmark.org: 1998. [<http://www.goldmark.org/netrants/webstats/>] Accessed on January 21, 2002.

Lakos, Amos. [Online] "The 2nd Northumbria International Conference on Performance Measurement in Libraries and Information Services: Report". Association of Research Libraries: November 25, 1997. [<http://www.lib.uwaterloo.ca/~aalakos/Present/North97/norsum.html>] Accessed on January 17, 2002.

LibEcon. [Online] "International Library Economics Research Study". Institute of Public Finance; Croydon, United Kingdom: 2002. [www.libecon.org] Accessed on January 18, 2002.

Luther, Judith. [Online] "White Paper on Electronic Journal Usage Statistics". The Council on Library and Information Resources; Washington, D.C.:October 2000. [<http://www.press.umich.edu/jep/06-03/luther.html>] Accessed on January 18, 2002.

National Center for Education Statistics. [Online] "About Survey-Academic Libraries". NCES; Washington, DC: 2002. [<http://nces.ed.gov/surveys/libraries/surveyAC.asp>] Accessed on January 18, 2002.

NISO Forum on Performance Measures and Statistics for Libraries. [Online] "Report on the NISO Forum on Performance Measures and Statistics for Libraries" National Information Standards Organization. Washington, DC: 2001. [<http://www.niso.org/news/reports/stats-rpt.html>] Accessed on January 18, 2002.

PALS Usage Statistics Working Group. [Online] "Forum on Vendor-Based Usage Statistics" Discussion Paper" Publishers and Libraries Solutions Group, Joint Information Systems Committee: June 2001 [www.usagestats.org] Accessed on January 18, 2002.

Poll, Roswitha [Online]"Managing Service Quality with the Balanced Scorecard Roswitha Poll". 67th IFLA Council and General Conference: August 16-25, 2001 [<http://www.ifla.org/IV/ifla67/papers/042-135e.pdf>] Accessed on January 21, 2002.

Troll. Denis A. [Online] "How and Why Are Libraries Changing?" Digital Library Foundation. January 9, 2001. [<http://www.diglib.org/use/whitepaper.htm>] Accessed on January 17, 2002.

UNESCO, Division des statistiques. [Online] "Library Statistics in Latin America and the Caribbean". 60th IFLA General Conference - Conference Proceedings. International Federation of Library Associations and Institutions; The Hague, Netherlands: 1994. [<http://www.ifla.org/IV/ifla60/60-unes.htm>] Accessed on January 18, 2002.

Wonsik, Shim; McClure, Charles R.; Bruce T. Fraser; Bertot, John Carlo; Dagi, Arif; Leahy, Emily H. Leahy. [Online] "Measures and Statistics for Research Library Networked Services: Procedures and Issues". Information Use and Policy Institute, Florida State University & Association of Research Libraries: October, 2001. [<http://www.arl.org/stats/newmeas/emetrics/phasetwo.pdf>] Accessed on January 17, 2002.

Appendix

International Standards Organization (ISO) 1998

- **ISO 11620: Information and documentation -- Library performance indicators**
www.iso.org

Description

It specifies a set of 29 indicators grouped in the following areas: (a) user satisfaction; (b) public services, which includes general indicators as well as specific indicators on providing documents, retrieving documents, lending documents, document delivery from external sources, inquiry and reference services, information searching, and facilities; and (c) technical services, including indicators in the area of acquiring, processing, and cataloging documents. Notable points in this proposed standard are its initial emphasis on user satisfaction; its inclusion of cost-effectiveness indicators; its clear and distinct way of describing each indicator, accompanied by suggestions regarding the methodology to be used in collecting the data; and a description indicating how to most accurately interpret each indicator.

National Information Standards Organization

- **NISO Standards on Library Statistics Z39.7**
www.niso.org/standards

Description

NISO, the National Information Standards Organization, has announced the formation of a committee to revise ANSI/NISO Z39.7-1995, Library Statistics. The committee will recommend incorporating improvements based on the existing survey instruments in use by nationally recognized U.S. library data collection programs. They are also charged to review the revised base standard in light of evolving methods of measuring electronic network performance, vendor and publisher-based use statistics, reporting methods, and service quality measures; and to advise NISO on how best to integrate new measures into Z39.7 and/or suggest other appropriate approaches (such as nationally supported best practices or guidelines) that over time might lead to the development of national consensus standards.

Measures

Current Areas of Measurement include:

1. Human Resources
2. Collection Resources
3. Physical Facilities
4. Finances
5. Services and Activity Measures

Revised measures are expected to be available soon.

European Commission within the Telematics Applications Programme

- **LibEcon: A research study into international library economics**

www.libecon.org

Description

The LibEcon project uses internet communications to develop a continuously updated database of library activities and associated costs in the context of their national economies. This is a project funded by DG13 of the European Commission within the Telematics Applications Programme. Gathering consistent information about the part played by libraries in developing the information resources within Europe is a difficult process. The project is examining the feasibility of assembling such information via electronic means. This internet site has been established to test and then generate an automatic means of collecting data. Data collected in past surveys has been added to the database, and visitors to this site can review past trends as well as compare national statistics.

Measures

1. Libraries: Total Administrative Units; Service Points
2. Collections: Books & Bound Periodicals; Current Periodicals – Titles; Current Periodicals – Subscriptions; Manuscripts; Microforms; Audio- visual Materials; CD- ROMs
3. Additions: Books & Bound Periodicals; Audio- visual Materials
4. Facilities & Services: Percentage Stock on Open Access; Percentage Catalogue Records Automated; Number of Workstations for users; Number connected to the internet (included above)
5. Use & Users: Registered Users; Loan Transactions; Number of Visits; Total number of staff and students
6. Library Staff (Full- time equivalent): Trained Librarians; Other Library Staff; Total Staff
7. Recurrent Expenditure: (Expressed in Tertiary currency, outturn prices): Staff; Acquisition of Stock; Electronic Information; Automation; Premises and Related Costs; New Buildings / Refurbishment; Other Expenditure; Total Expenditure.
8. Income (Expressed in Tertiary currency, outturn prices): Public Funding; Fees & Charges; Other Income; Total Income.
9. Capital Expenditures (not included above): New Buildings / Refurbishment; Acquisition of Stock; Automation; Other Capital Expenditure; Total Capital Payments

International Coalition of Library Consortia (ICOLC), US

- **Guidelines for Statistical Measures of Usage of Web-based Information Resources (Dec. 2001)** <http://www.library.yale.edu/consortia/>

Description

This is the 2001 revision of the original ICOLC guidelines developed in 1998. The 2001 revision is intended to provide consortia administrators with the information needed to effectively carry out their responsibilities and to provide vendors a practical framework in which to deliver usage

statistics in the current environment. The data elements to be reported have been simplified, while administrative aspects of confidentiality, access, delivery, and report format have been strengthened.

Measures

1. Number of Sessions (logins) must be provided in order to satisfy reporting requirements of government agencies and professional organizations. ICOLC recognizes that the definition, collection, and reporting of this measure are subject to interpretation. In the stateless web environment, statistics gathered as "sessions" can provide only a rough indication of the number of actual sessions conducted, thus limiting the overall meaningfulness of this particular indicator.
2. Number of Queries (Searches) categorized as appropriate for the vendor's information. A search is intended to represent a unique intellectual inquiry. Typically a search is recorded each time a search form is sent/submitted to the server. Subsequent activities to review or browse among the records retrieved or the process of isolating the correct single item desired do not represent additional searches, unless the parameter(s) defining the retrieval set is modified through resubmission of the search form, a combination of previous search sets, or some other similar technique. Immediately repeated duplicate searches, double clicks, or other evidence indicating unintended user behavior should not be counted.
3. Number of Menu Selections categorized as appropriate for the vendor's system. If display of data can be accomplished by browsing (the use of menus), this measure must be provided. (e.g. an electronic journal site provides alphabetic and subject-based menu options in addition to a search form). The number of searches and the number of alphabetic and subject menu selections should be tracked.
4. Number of Full-Content Units examined, downloaded, or otherwise supplied to user, to the extent these are recordable and controlled by the server rather than the browser.
 - Journal articles – by journal title with ISSN and title listed
 - E-Books – by book title with ISBN and title listed
 - Reference materials – by content unit appropriate to resource (e.g. dictionary definitions, encyclopedia articles, biographies, etc.)
 - Non-textual resources – by file type as appropriate to resource (e.g. image, audio, video, etc.)
 - Number of Turn-Aways, peak simultaneous users, and any other indicator relevant to the pricing model applied to the library or consortium.

ARL & Information Use and Management Policy Institute, Florida State University

- **ARL E-Metrics Project**

Description

One key goal of this project is to develop, test, and refine selected statistics and performance measures to describe electronic services and resources in ARL libraries. The second key goal is to

engage in a collaborative effort with selected database vendors to establish an ongoing means to produce selected descriptive statistics on database use, users, and services. The third key goal of the project is to develop a proposal for external funding to maintain the development and refinement of networked statistics and performance measures.

Based on a substantial field-testing process (described in detail in the report), the study team recommends a number of network statistics and performance measures that provide indicators of library networked services and resources. <http://www.ii.fsu.edu/Projects/ARL/ARL.abstract.html>

Measures

1. Patron Accessible Resources: Number of electronic full-text journals; Number of electronic reference sources; and Number of electronic books.
2. Use of Electronic Resources and Services: Number of electronic reference transactions, Number of logins (sessions) to electronic databases, Number of queries (searches) in electronic databases,
3. Number of Items Requested in Electronic Databases, and Virtual Visits to Library's Web Site and Catalog.
4. Expenditures for Networked Resources and Related Infrastructure: Cost of electronic full-text journals; Cost of electronic reference sources; Cost of electronic books; Library expenditures for bibliographic utilities, networks, and consortia; and External expenditures for bibliographic utilities, networks, and consortia.
5. Library Digitization Activities – Size of library digital collection; Use of library digital collection; Cost of digital collection construction and management.

For more information about the performance measures outlined here, visit:
<http://www.arl.org/stats/newmeas/emetrics/phasetwo.pdf>

Manchester Metropolitan University & CERLIM, UK

- **EQUINOX : Library Performance Measurement and Quality Management System (November 2001)** <http://equinox.dcu.ie>

Description

One major aim of the EQUINOX project was to further develop existing international agreement on performance measures for libraries, by expanding these to include performance measures for the electronic library environment. These electronic library performance indicators (PIs) were devised during the EQUINOX project after extensive consultation with the professional community. The purpose of this set of indicators is to enhance and complement the indicators for traditional library services presented in ISO 11620: Library Performance Indicators, not replace them. Not only does EQUINOX provide a set electronic library performance indicators, a consolidated list of data sets and precise definitions of terms, but also, of key importance, they outline collection methodologies.

Measures

The fourteen performance indicators developed by EQUINOX are listed below:

1. Percentage of the population reached by electronic library services
2. Number of sessions on each electronic library service per member of the target population

3. Number of remote sessions on electronic library services per member of the population to be served
4. Number of documents and entries (records) viewed per session for each electronic library service
5. Cost per session for each electronic library service
6. Cost per document or entry (record) viewed for each electronic library service
7. Percentage of information requests submitted electronically
8. Library computer workstation use rate
9. Number of library computer workstation hours available per member of the population to be served
10. Rejected sessions as a percentage of total attempted sessions
11. Percentage of total acquisitions expenditure spent on acquisition of electronic library services
12. Number of attendances at formal electronic library service training lessons per member of the population to be served
13. Library staff developing, managing and providing ELS and user training as a percentage of total library staff
14. User satisfaction with electronic library services

www.equinox.dcu.ei

Publisher and Libraries Solutions Committee

- **PALS Working Group on Vendor Based Usage Statistics**

www.usagestats.org

Description

Established in the U.K. and chaired by Richard Gedye, Journals Sales and Marketing Director, Oxford University Press, addresses the following:

- Research current and planned availability of vendor-based usage statistics for online products.
- Research current initiatives to develop accepted codes of practice/guidelines in this area.
- Research current library wants.
- Produce realistic code of practice/guidelines.
- Market the code of practice/guidelines to vendors and hosting systems; get them accepted/adhered to.
- Research the possibility of centralized provision, e.g., a usage statistics clearinghouse.

Measures

Over a hundred data elements organized according to:

Inputs:

1. Page Views: Bibliographic Data; Type of Page; Source of Page; How page was discovered; How page visitor was authenticated; IP address; Login ID; Access time; Access rights.
2. Session data
3. Market elements
4. Data Processing – ensuring data integrity and accuracy

Outputs:

1. Format

2. Minimum basic data subsets/reports
3. Delivery Method
4. Searches

http://www.jisc.ac.uk/curriss/collab/c6_pub/uswg/index.html

ARL and Texas A&M University

- **LibQUAL+**

Description

This pilot project reexamines traditional methods of assessing effectiveness while testing new theories to measure delivery of services to the consumers of research library resources. It is vital to recognize that research libraries are not alone in this predicament. The libraries at all postsecondary institutions face the same dilemma. Community colleges, four year liberal arts colleges, and the many other colleges and universities supporting graduate study must also rely upon expenditure metrics to assess their libraries. Thus, the need for new measures is common to all libraries. While the project's research is grounded in the research library community, the emergent tools, with further research in other library cohorts, could be replicated at postsecondary libraries generally.

In the ARL-endorsed design, the LibQUAL+ instrument (an enhanced derivative of SERVQUAL) is being tested for score validity in comparison across libraries and across contexts, freeing institutions from reliance upon locally developed assessments. The project proposes to establish a national perspective, providing local institutions with data fine enough to diagnose local management issues. Where there are deficits, libraries will have the opportunity to make improvements that fit the local situation. A cohort of best practices across all the dimensions that define library quality may emerge, facilitating the efforts of administrators to tailor available resources to the institutional mission. Trends across the dimensions can be identified at the national level, placing local results in an important context for librarians and campus administrators alike.

<http://www.arl.org/libqual/>

Measures

For the initial analysis, the responses from 4,407 participants from 11 institutions were analyzed using a hierarchical model of factor analysis. In the first stage of the analysis, the 41 items on the survey were found to cluster into five first-order factors, or dimensions

:

Affect of Service

Reliability

Library as Place

Provision of Physical Collections

Access to Information

<http://www.arl.org/newsltr/212/libqual.html>

German Research Council, University and Regional Library Münster, the Bavarian State Library and the State and University Library Bremen

- **Balanced Scorecard**

Description

A German project, sponsored by the German Research Council (DFG), has developed an integrated quality management system for academic libraries. The project is chaired by the University and Regional Library Münster, partners are the Bavarian State Library Munich and the State and University Library Bremen. The three libraries are among the largest in Germany, each with special tasks, activities, and operating conditions. Thus the project could rely on a broad and differentiated view of management issues in academic libraries. The project started in June 1999 and will be finished in autumn 2001. The results will be published in a handbook and a software for the data collection and the management process will be added.

The project partners decided to use the Balanced Scorecard as tool for the management system. This concept was originally developed for the commercial sector. It "translates" the planning perspective of an institution (mission, strategic vision and goals) into a system of performance indicators that covers all important perspectives of performance: finances, users, internal processes and improvement activities.

Measures

The system integrates:

- (1) financial and non-financial data,
- (2) input and output data,
- (3) the external perspective (funding institutions, users) and the internal perspective (processes, staff),
- (4) goals and measures taken,
- (5) causes and results.

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

<http://www.ifla.org/IV/ifla67/papers/042-135e.pdf>

University of Newcastle, Australia and Ernst&Young

- **Activity Based Costing Project**

Description

The University of Newcastle's Information and Education Services Division (IESD) saw an opportunity to improve its own management processes and contribute to the momentum of strategic cost management within Universities by initiating an activity based management pilot project in February 2000. Its focus was

the activity based costing of Information Technology and Library activities as a tool for improving planning and decision-making. It was also seen as enabling more accurate determination of funding levels required for particular services and continuous improvement through benchmarking.

The project is broken into two key phases, phase one involves a pilot study costing exercise at one university - nominated to be the University of Newcastle - and phase two which will see the costing methodology, tools and techniques developed from the pilot study rolled out to other Australian universities.

The pilot study phase one at The University of Newcastle will focus on examining the Information Technology and Library activities of this institution. This will involve analysing where these activities are undertaken across the institution, including the central support areas and the faculties/division. This will ensure that The University of Newcastle is made aware of the full cost of providing these activities across the whole institution. The pilot study will identify a standard set of activities undertaken within the Information Technology and Library area of The University of Newcastle. It is anticipated that the number of activities identified will not exceed 100. With respect to cost objects it is the intention of attributing the activity costs down to the divisions, hence in this study the divisions operating at The University of Newcastle will be the cost objects.

<http://www.newcastle.edu.au/services/iesd/abc/abc-newcastle.html>

Measures

Eight categories of activity-based costs:

Information Resources: Integrated services with client Services program; Cataloguing services; short loans; ILL; Inter-campus ILL; Answering lending enquiries; Lending and renewals; Self-check facilities; Returns and shelving; Lending equipment; Administrative costs in adding an item to the collection; Binding-monographs and serials; Maintaining library systems; Regional archives and rare book collection.

Client Services: Support for information resources activity; Lending equipment; Information desks and IESD referral services; Management of electronic information skills; Computer labs; Providing consultancy services to assist teaching and research; Selecting and evaluating new and continuing information resources; Resolving computer problems; Planning, management and implementation of significant software installations; Deployments and provision of software; Advising clients on use of hardware/software; Managing desktop computer standards; Evaluation and quality assurance.

IT Infrastructure: Maintenance and development of presentation facilities; Maintaining specialised electronic equipment; Central computing infrastructure; Computer labs; Telephone operations; The data network.

Information Systems: Activities in support of packaged corporate systems; Activities in support of in-house corporate information solutions; Evaluation and implementation of ad hoc reporting (Tools for desktops)

IT Training (Learning & Development)

Web Development Team: Web application development and maintenance; Development and maintenance of web sites; Leadership, coordination and support for web sites.

IESD Executive and Administration

Other Resource Areas: Provide and implement a QA framework; Preparing strategic plans and budgets; Supporting strategic partners; Infrastructure development; Student photocopying; Central costs; Providing access to library collection; Providing access to library buildings; Providing access to IT facilities; Maintain, process and provide access to university archives.

For a full report activity based measures, see:

Information and Education Services Division, The University of Newcastle. Activity Based Costing: A Study to develop a costing methodology for Library and Information Technology Activities for the Australian Higher Education Sector. Department of Education, Training and Youth Affairs; April 2001.[Online]

<http://www.dest.gov.au/highered/otherpub/libraries/libraries.pdf>

University of California, Davis Campus

- **Cost/Performance of Print vs. Licensed Electronic Journal Titles**

Description

There is evidence that access to electronic journals has affected the use of print journal titles in academic libraries. Availability of links in indexing and abstracting sources, cross references in other online publications, increased remote use, and other technological factors all influence the use of electronic materials, resulting in a different use profile for library holdings when they are available electronically. The pricing structures generally offered by many electronic journal vendors are frequently based on a print production model, however, and do not take into account emerging differences in the characteristics of use in the electronic environment. The purpose of this study is to explore the use, cost, and value of a specific set of materials currently available in both print and electronic formats to verify likely differences in cost benefit and cost performance ratios between the two formats.

Measures

1) Collect and aggregate use data on electronic and print titles. Use data will be collected from journal vendors and the library circulation system for a specified time period. Assumptions about comparability of print and online use data will be established by comparing historical print (i.e. pre-online) and current online use of several high-use titles. A central issue to be addressed is article-level access in the online environment versus volume-level use recorded in the library circulation system.

2) Itemize costs. Cost data will be assembled from several sources, including library serials check-in system, vendors, California Digital Library, and others. Particular attention will be paid to the complexity of consortial licensing and variability in online access (e.g., full-text vs. abstracts, indexing coverage, etc.). The output of this phase will be a list of titles, formats, and estimated costs for the time period specified in Part 1.

3) Calculate cost per use and develop draft cost benefit and cost performance indicators. Cost benefit analysis will calculate ratios of cost, use, and value of the item as indicated by journal impact factor, institutional citation report, or similar citation analysis input, as well as level of indexing coverage and online linking. Cost performance will be calculated by examining the ratio of the online title's cost, use, and value in relation to the print counterpart as well as to the rest of the collection subset under study. The output of this last phase will be a report to library administration.

German Library Association and Bertelsmann Stiftung

- **BIX Library Index**

Description

BIX is a cooperative venture of the Bertelsmann Foundation and the German Libraries Association (Deutscher Bibliotheksverband = DBV) for the measurement of performance in public libraries: A few central indicators are compressed into a national index to present the performance ratings in an easy-to-digest form. This will help communications between those responsible in the administration, in local politics and in the library. The annual results are published in an attractive format – the BIX Magazine.

BIX was started in October 1999 (planned duration: 3 years). In the first year of the project 107 libraries of differing sizes participated. Up to December of each year additional libraries can register for BIX by concluding a cooperation agreement with the Bertelsmann Foundation. Libraries contribute an amount of DM 300 per annum to the overall costs of the project. <http://www.bertelsmann-stiftung.de/project.cfm?lan=en&nid=71&aid=2103>

Measures

Available soon in English through the Proceedings of 4th Northumbria International Conference on Performance Measurement in Libraries & Information Services (February 2002). For information in German, visit the BIX Library Index web site at <http://www.bix-bibliotheksindex.de>