

Learning from Other Libraries: Benchmarking to Assess Library Performance

cost per journal resources purchased per customer

average total expenditures

library subsidies for document delivery services

**By Paula Deutsch and
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... The NIST Research Library's Self-Evaluation

THIS IS THE SECOND ARTICLE IN A SERIES DESCRIBING ASSESSMENT ACTIVITIES at the National Institute of Standards and Technology (NIST) Research Library and their role in decisionmaking and strategic planning. A previous article described activities centered on the development, administration, and interpretation of a customer survey. A third article will discuss how the results of the customer survey and benchmark study were incorporated into the library's operational and strategic planning.

NIST and the NIST Research Library

NIST is a nonregulatory federal agency within the U.S. Department of Commerce. Its mission is "to develop and promote measurement, standards, and technology to enhance productivity, facilitate trade, and improve the quality of life." It is focused on advancing the nation's technology infrastructure and supporting industry. NIST operates in two locations: Gaithersburg, Maryland, and Boulder, Colorado. It employs about 3,000 scientists, engineers, technicians, and support and administrative personnel. About 1,600 guest researchers complement the staff.

The NIST Research Library is one of three work units within the Information Services Division (ISD). The library has a staff of 17 and maintains a collection of about 300,000 volumes and 1,150 journal subscriptions. Its primary customers are the researchers in the NIST laboratory programs at the Gaithersburg location. The laboratories conduct research in a variety of physical and engineering sciences, including biotechnology, building and fire research, chemistry, electronics, information technology, manufacturing, materials science, mathematics, metrology, and physics. The Advanced Technology Program, which co-funds research and development partnerships with the private sector, is also a significant customer group.

The Call to Benchmark

When the benchmark study was initiated in 2001, the Research Library's base operating budget for the purchase of all collection materials had been static since 1995. In FY 2002, the library received an increase of 11 percent to its base budget. However, over the last six years, the cost of scientific journals has increased by 24 percent. (This number is based on statistics supplied by the Association of Research Libraries at <http://www.arl.org/stats/arlstat/graphs/2001/2001t2.html>.) Based on the requirements of the NIST scientific and research community, the Research

Library canceled subscriptions to materials considered dispensable and redeployed expenditures to critical or core journal titles and databases.

This benchmark study grew out of concerns expressed by the NIST Research Advisory Committee (RAC) about the declining state of the Research Library's collection. The RAC's role includes providing advice and recommendations to the NIST director and Senior Management Board on scientific issues; assessing the climate and status of forefront research activities at NIST; and acting as a spokesperson for scientific concerns and opportunities. In its *Annual Report to the NIST Director* (April 2001), the RAC indicated that it considered the Research Library to be a critical element of the NIST infrastructure; however, its stagnant and inadequate funding was undermining its ability to maintain its high standard of service.

In response to these concerns, the NIST Director's Office asked ISD to undertake several assessment activities to determine whether additional funding for the Research Library was warranted. While management agreed with RAC that the Research Library is indeed a vital NIST resource, determining spending priorities to fund all vital NIST overhead activities involved making difficult choices, given the limited funds. The benchmark study was conducted in part because of the requested assessment activities and in part because the exercise of benchmarking supports the goals of ISD and its organizational unit (Technology Services) in better understanding its customers and improving its services to them.

Making Use of Published Data

As a first step in preparing for the benchmark study, library staff studied the literature to identify benchmark or survey instruments used by other libraries or library associations; identify libraries that had participated in benchmark studies; develop criteria for determining

potential benchmark partners; and identify trends affecting the library field as reported in published benchmark studies. Library staff focused on the survey instruments and data collected by the Association of Research Libraries (ARL), Washington, DC; the U.S. National Commission on Library and Information Science (NCLIS), Washington, DC; the National Library of Canada (NLC), Ottawa, ON; and the U.S. National Center for Education Statistics (NCES), Washington, DC. Staff also consulted two international standards, *ISO 2789: International Library Statistics* and *ISO 11620: Library Performance Indicators*, and an American standard, *ANSI/NISO Z39.7-1995: Library Statistics*.

A report was prepared for NIST management in the summer of 2001 comparing NIST Research Library data with ARL data on library materials budget expenditures and interlibrary loan/document delivery statistics. Percentage comparisons were made of the differences (in terms of collection size and budgets) between ARL libraries and the Research Library. The report also included a description of the approach to be used for conducting our own benchmark study and the timeline for completing it.

Conducting Our Own Benchmark Survey

Information Services Division management assembled a five-member team that represented a cross section of ISD. Three people were from the Research Library and Information Group, one person represented the Electronic Information and Publications Group, and one person came from the Museum and History Program. This provided representation and experience both within and external to the library field. The team met twice monthly for a year. Meetings were used to develop a plan of action, design the survey instrument, coordinate communication with potential benchmark partners, and evaluate and analyze the data received.

Developing the Survey Instrument

ISD management provided the Benchmark Team with a list of topics to be addressed by the benchmark study. The team began by exploring survey instruments from several notable library organizations. While the work of other organizations provided some useful insights into library performance measures and statistics, the ARL data were found to be the most comprehensive; they provided ISD with a number of measures on which to compare the Research Library; and they provided clearly articulated standards for quantifying library resources. ARL data collection activities are widely recognized and highly re-

garded by the library and higher education communities, and the outputs from ARL's data collection activities define the norms for many academic and nonacademic libraries. From these ARL models, the team formulated its own survey instrument. The final survey included 69 questions that assessed collections, services, staffing, budgets, and expenditures.

As a means for pre-testing the survey instrument, the team completed the survey using data for the Research Library. By doing this, the team was able to identify questions that were unclear or vague. Based on what was learned from this exercise, the team then made revisions to the survey.

Identifying Benchmark Partners

NIST management asked that ISD include government, academic, and private sector libraries in its benchmark survey. However, it is important to note that private sector libraries may be fundamentally different from the Research Library. The information needs of the customers supported by these libraries are more likely to be tied to short-term business goals and less focused on the broad needs of generic research and development.

Based on information available from the *American Library Directory*, 15 potential benchmark partners were identified. These libraries/information centers appeared to be similar to the Research Library in the following ways: collection size, library materials budget, size of customer base, library staff size, and a target audience of researchers in the science/technology fields.

Once potential partners were identified, each member of the team was assigned three libraries/information centers to contact by phone. The team agreed on a set of talking points that would be communicated to each potential partner. Of the 15 libraries/information centers contacted, 7 expressed a willingness to participate in the study. The team member who originally contacted the benchmark partner remained the contact point throughout the process. The amount of interaction that occurred while benchmark partners were completing the survey varied from partner to partner.

The libraries that agreed to participate were IBM—Thomas J. Watson Research Center Library, Naval Research Laboratory—Ruth H. Hooker Research Library, Oak Ridge National Laboratory Research Libraries, Sandia National Laboratories Technical Library, Xerox Corporation Technical Information Center, and two libraries that asked not

"Of the 15 libraries and information centers contacted, 7 expressed a willingness to participate in the benchmark study."

to be identified as participants. The group includes three federal libraries, two corporate special libraries, and two nonprofit research/academic libraries. Two libraries did not provide any financial information and a third library withheld salary information. All libraries were guaranteed that they would not be identified with any particular set of data.

Administering the Survey

Each benchmark partner was asked to complete the survey in four weeks. Some partners returned the survey in less time and others needed more time. In cases where benchmark partners had not submitted a completed survey within the allotted time, they were contacted to verify that they were still planning to complete the survey and to see if they needed help with the survey.

Once all partners had returned their completed surveys, the team looked across the data to identify any area where it appeared that a benchmark partner had interpreted a question differently than other partners. The team then created a list of areas that needed further clarification from the benchmark partners. Many benchmark partners were contacted with follow-up questions.

Assimilating the Data

Once the team determined that it had received all the data and clarification it was likely to get, it began looking at the data more closely. Each team member was assigned a process or function addressed by the survey to analyze in greater detail. This analysis was shared with all team members. In addition, spreadsheet software was used to create charts and graphs that helped present visual comparisons of the data.

All this accumulated information was displayed on the walls of a conference room. Each team member was asked to review it and identify three areas where significant observations could be made. Again, each member reported back to the group. From this exercise, the team was able to develop a list of topics it felt should be addressed in the Benchmark Report.

information outlook

Because of the length and breadth of the survey, the team amassed a large quantity of data. The decision was made to report only on data that met two primary criteria. The first was that all benchmark partners reporting data on a specific question reported the data in a similar manner. For example, the survey asked benchmark libraries to indicate the size of their existing collections. Some libraries reported the number of journal volumes and others reported the number of journal titles. Some libraries included items in microform while others did not. Therefore, no comparisons were made based on existing collection size. The second criterion was that the data show significant gaps that allowed ISD to identify best practices used by the Research Library or that indicated possible best practices to emulate from the benchmark partners.

Each member of the team was assigned a section of the report to write. An editor was brought into the process to

give the finished product a single voice and to ask probing questions about the details of what was being reported. In addition, feedback from ISD management as well as management at the operating unit level (Technology Services) helped to formulate a well-

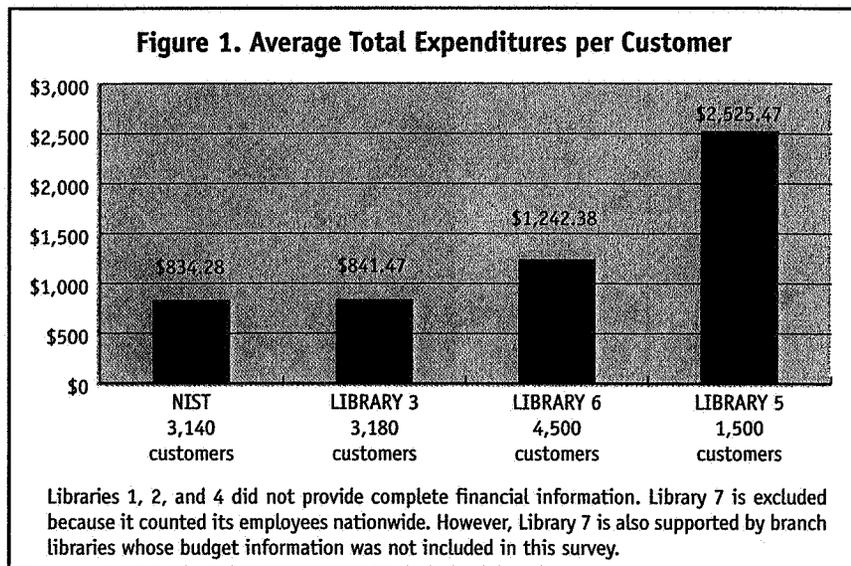
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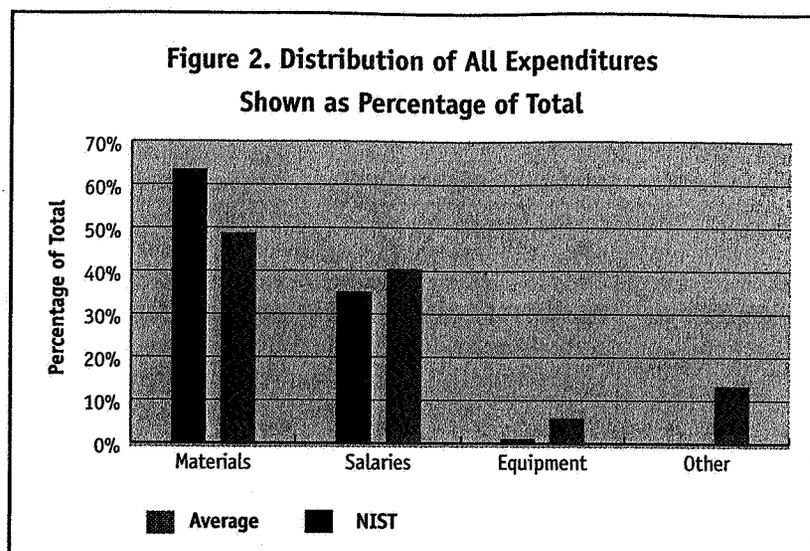
Reporting the Results

Each benchmark partner received both an electronic version and printed version of all the data collected from this study. In addition, the partners received charts created during the analysis process. They will continue to receive copies of any published reporting on the project results.

A variety of venues have been used to communicate what the Benchmark Team learned to library customers and stakeholders. An internal report was distributed to the NIST director, members of the RAC, members of the Research Library Advisory Board (RLAB), and all NIST laboratory directors. The RLAB also viewed a 20-minute presentation on the findings of the study. Information about the study has been reported to the larger NIST community through ISD's internal newsletter, *ISD Directions*.

Figure 1. Average Total Expenditures per Customer





Significant Results

The benchmark study revealed three areas—overall budget, materials or collections budget, and interlibrary loan/document delivery services—in which the Research Library differed significantly from its benchmark partners.

When looking at the Research Library's operations as a whole, the Benchmark Team noticed that, of the libraries disclosing complete financial information, (including materials or collections, salary, equipment, and other costs), the Research Library spends the least per customer (see figure 1).

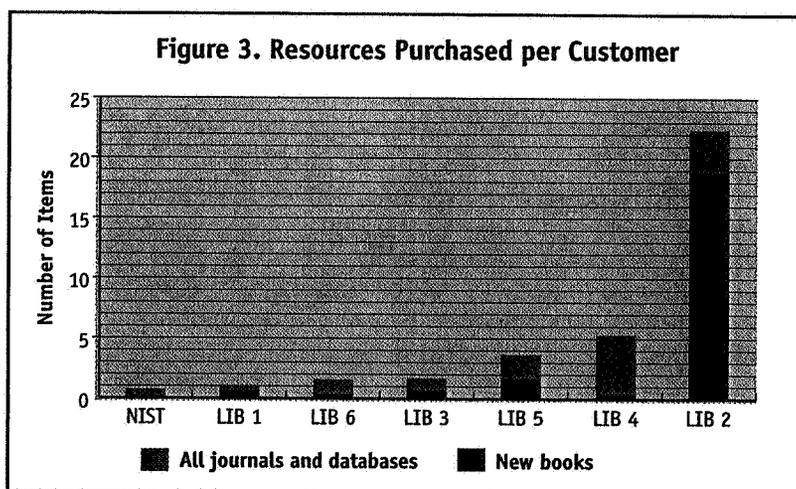
The Research Library is also spending far above the average percentage of its total allocation on materials, pulling from other areas of its budget to cover its collections costs. (The term "materials" is used here to refer to the library collections and includes journals, books, electronic resources, and interlibrary loan/document delivery. It also includes the costs of maintaining these collections, that is, the binding of journals and the fees associated with the use of bibliographic utilities, such as OCLC, used for cataloging. Salaries, training, equipment, and supplies are not included.) In comparison to its benchmark partners, its other operational expenditures are low (see figure 2).

While the Research Library spent a larger percentage of

its entire budget on materials than any of its benchmark partners, it purchased the fewest titles per customer. On average, it purchased fewer than 0.77 items per customer (see figure 3). The average among the benchmark partners was 5.24.

The low resource-purchase per customer is partly due to the Research Library's higher per journal costs. Its average cost per journal title in FY 2001 was \$1,137, while the average among benchmark partners reporting these costs was \$772 (see figure 4).

An overview of the Research Library's interlibrary loan/document delivery service reveals a highly productive staff working diligently to find free information resources. Although the Research Library placed a much greater than average number of requests, it paid fees for the fewest number of requests. The Research Library received 72 percent of its items at no cost (20 percentage points higher



DATA TABLE	NIST	LIB 1	LIB 6	LIB 3	LIB 5	LIB 4	LIB 2	Average
New Books	0.21	0.68	0.41	0.74	1.73	0.47	18.88	0.71
All Journals and Databases	0.56	0.41	1.19	0.98	1.98	4.89	3.53	1.67
Total Number of Titles	0.77	1.09	1.60	1.72	3.71	5.36	22.41	5.24

Library 7 has been excluded from these figures because of the distorted size of its customer base. Library 2 has access to its parent organization's electronic resources at minimal or no cost.

than the next closest library). Because of this, of the five libraries reporting these data, the Research Library had below average per-item costs for borrowed items.

But when libraries did accrue costs for borrowing items,

the Research Library's average costs for the service were the highest of the five libraries that provided information (see figure 5). This is, in part, because libraries that charge back all document delivery costs to their customers paint a distorted picture of document delivery costs. Libraries showing the lowest costs or subsidies are charging all or most of these costs back to the customer, so they do not show up as library expenditures.

Figure 4. Average Cost per Journal

	LIBRARY 3	LIBRARY 6	LIBRARY 1	LIBRARY 7	NIST	LIBRARY 5
Average Cost per Journal	\$130.03	\$502.37	\$581.25	\$800.00	\$1,137.44	\$1,481.19
Libraries 2 and 4 did not provide any financial information.						

data on several aspects of its document delivery services in order to facilitate analysis in two areas: a comparison of the costs of subscribing to specific journal titles with the costs of repeatedly obtaining individual articles from those journal titles and a formal study, based on internal statistics,

Figure 5. Average Per-Item Library Subsidies for Document Delivery Services

	LIBRARY 5	LIBRARY 1	LIBRARY 3	LIBRARY 7	LIBRARY 6	NIST
Average Library Subsidy when fee is paid	\$0.00	\$0.33	\$2.54	\$20.00	\$20.87	\$21.73
Charge back to customer	Yes	Yes	Yes	No	Yes	No
Libraries 2 and 4 did not provide any financial information. Library 6 regards its pricing structure for charges back to the customer as proprietary information so it is difficult to identify what their actual fee per document is.						

to identify document suppliers who charge less but can still meet turnaround time requirements. The Research Library is finding it considerably easier to amass these data with its recent purchase of interlibrary loan/document delivery management software.

The Research Library filled more outside requests than any of the six benchmark partners who were able to provide these data: five times the next highest number of outside interlibrary loan/document delivery requests filled. The limited data collected in this study appear to support the argument that a relationship exists between the number of items loaned to other libraries and the willingness of other libraries to reciprocate by supplying items at no cost. This is evident in data provided by the benchmark partners: Of the five libraries giving complete data on this question, there is a clear correlation between the number of items supplied to other libraries and the number of items obtained at no charge (see figure 6).

Lessons for the NIST Research Library

The Benchmark Team identified two areas in which the Research Library can reduce its operational costs: journal costs and document delivery costs.

The Research Library has among the highest costs per journal title, even though the subject focus of all the libraries studied is fairly homogeneous. Based on these data, the Research Library is exploring opportunities for decreasing its costs per journal. As a member of the National Research Library Alliance (NRLA), the Research Library has recently joined consortium purchase agreements for titles published by Wiley InterScience, the Institute of Physics, and the American Chemical Society. This has resulted in a decrease in cost per journal title.

The Research Library can also benefit by finding ways to reduce its document delivery costs. It has begun collecting

The Benchmark Team also identified areas in which the Research Library excels. Its use of a wide

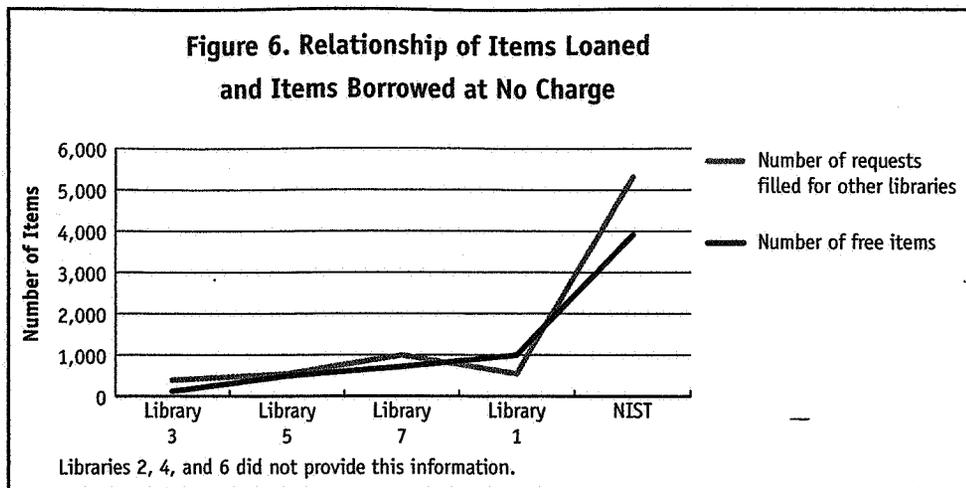
variety of methods for communicating with and soliciting feedback from its customers demonstrates a solid commitment to providing customer-focused services. It has also been able to provide a variety of services while maintaining the highest ratio of customers per library staff member.

Lessons Learned About the Benchmark Process

Conventional wisdom told the Benchmark Team that the survey had far too many detailed questions to get responses. However, the team had been asked to address a wide range of topics and was unable to reduce the number of questions. While some libraries/information centers that were contacted chose not to participate because of the length of the survey, a significant number were willing to tackle it. This appeared to be, in part, because some benchmark partners saw the survey as a means to satisfy requirements from their own management to benchmark and in part the result of a commitment to the larger library community.

The vast quantity of data did present problems when it came time to interpret it. Even though the Benchmark Team's interests primarily focused on easily quantified information and great care was taken to provide definitions of what was being asked, there was still a lot of room for interpretation. Trying to consider and adjust for variations in the way different benchmark partners conducted business over such a large scope of data became confusing and overwhelming at times. This may have prevented the team from getting a clearer, more focused picture of specific operations and costs.

The benchmarking project involved a large time commitment; however, it provided a wealth of learning opportunities. It provided a means for careful self-evaluation, a vehicle for understanding and opening up communications with peer institutions, and opportunities to demonstrate the value of the library's services to stakeholders and customers. It is only a first step toward organizational learning and improvement, and continues to affect the Research Library's strategic planning. ●



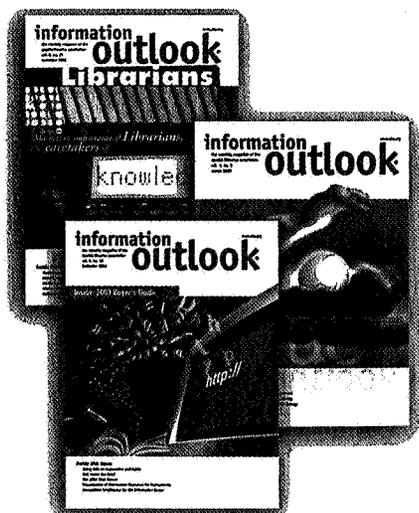
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