

Changes in usage, usability, and user support

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Abstract

Two research projects are being conducted as part of the Digital Library Federation's initiative on usage, usability and user support. In the first project, preliminary survey results indicate that library usage and usability data is often gathered, but not analyzed and put to use; that libraries are reorganizing and re-staffing to centralize and manage data gathering, analysis and application, and that libraries need guidance in gathering data appropriate to their strategic needs and that will enable comparison with peer institutions. Further research will be designed and conducted to address strategic aims and audiences that are not well served with existing data gathering methods. The survey report will be available in June 2001.

The second project leverages existing new measures initiatives and formulates additional measures to develop baseline and comparable trend data that will document and help explain changing patterns of demand for and use of academic library collections, services and facilities. To provide a broader environmental context in which to interpret changing trends in library use, this research project includes examining the use of information resources, services and computing facilities not provided by the libraries, as well as changes in academic curricula and practice that could impact demand for and use of the library. Tentative plans are to gather trend data for the selected measures for a five-year period, beginning 1999-2000.

The Problem

Libraries are changing in response to changes in the environment and in the behavior of users. The changes are evolutionary. Libraries are adding new, digital resources and services while maintaining most of the old, traditional resources and services. Finding and funding the appropriate balance of digital and traditional initiatives challenges strategic and financial planners. Librarians feel pressured to respond to the changing needs and expectations of users, and in some cases, pressured by university and college administrators to account for their expenditures and demonstrate the outcomes they achieve. Though traditional and emerging library performance measures capture some of the changing costs of library operations and the changing behaviors of users, they do not capture the changing needs and expectations of library users, or demonstrate the educational and research outcomes, cost-effectiveness, or cost-benefits of library expenditures. New meas-

ures being developed focus on assessing *how* library use is changing in the networked environment, but these measures will not explain *why* library use is changing or capture the full scope of how libraries are responding to these changes. The absence of standard definitions and procedures for gathering and interpreting reliable information that would explain shifting patterns in library use, costs, and operations is adversely affecting strategic planning and the cases that library directors must make to win or bolster support for the library and its changing directions. Academic libraries cannot effectively prepare for the future or position themselves on campus until they understand their changing roles in the current learning and research environment - which itself is changing rapidly.

For further discussion of the problem, see "How and Why Are Libraries Changing?" by Denise A. Troll, a white paper available at <http://www.clir.org/diglib/use/whitepaper.htm>. A revised version of the paper, entitled "How and Why Libraries Are Changing: What We Know and What We Need to Know," is forthcoming in *Portal: Libraries and the Academy*.

The Approach

The Digital Library Federation (DLF) convened a meeting on usage, usability, and user support at the Forum on Organizational Practices, April 2000, in Atlanta, Georgia. The purpose of the meeting was to identify a research, development, and sharing agenda that would inform and support efforts to evaluate the use and usability of digital library collections and services. The meeting participants enthusiastically endorsed a preliminary framework and agenda for a DLF initiative in this area. (See <http://www.clir.org/diglib/use/useframe.htm>.) In November 2000, the DLF offered Denise A. Troll a Distinguished Fellowship to lead the usage, usability, and user support initiative. The Fellowship involved two primary tasks:

- Study the usage and usability assessment practices of leading digital libraries.
- Study the assessment priorities of academic library directors and facilitate research that supports their highest priority need for data.

This paper provides a brief overview of the process and outcomes of both of these studies.

Study of Usage and Usability Assessment Practices

The usage and usability survey was conducted from November 2000 through February 2001 to:

- Help libraries understand how and why to conduct use and usability assessments of online collections and services
- Surface issues and problems that arise from real experience conducting such assessments
- Stimulate discussion and essential research in this area

Telephone interviews were conducted with 71 individuals at 24 institutions, for a 92% institution response rate and an 86% participant response rate. With one exception, the institutions were academic libraries. The interviews took thirty to sixty minutes each. Most were individual interviews; a few were conference calls. Participants were asked a standard set of open-ended questions. Follow-up questions varied based on the work being done at the institution. The results of the survey present assessment practices and concerns in leading digital libraries. They are neither comprehensive nor representative of library efforts, but indicative of trends that are likely to inform library practice. The study offers a qualitative, rather than quantitative, assessment of issues and practices in usage and usability data gathering, analysis, and application.

The full report of the results of the usage and usability survey will be available on the DLF web site in September or October 2001. The discussion in this article focuses on issues and problems that leading digital libraries have encountered in conducting use and usability assessments, which suggest areas for future work. The full report will explain why to conduct use and usability assessments, provide basic instruction in how, when, and why to use popular research methods, and describe real experiences and lessons learned from conducting and applying the results of such assessments. Sample research instruments and a bibliography for further information about different research methods will also be included.

Participants from each institution interviewed in the survey talked about the changing focus in their libraries. Driven by a service ethos and perhaps by a broader institutional imperative, the libraries' primary focus is to meet the needs and expectations of their users. Though participants used different vocabularies to describe their efforts, each institution is endeavoring to define its user communities, assess their skills, identify their areas of interest, and understand what they value. Three common threads of the user-centered discussion were the design of Web user interfaces, concerns about undergraduate students, and the importance of continuous marketing of library collections and services.

The promise and potential of Z39.50 to provide a single user interface for information retrieval has not been realized. Even if libraries have expended the effort to provide a single interface to all their Z39.50 supported products, their Web sites no doubt link to collections and services that are not accessible through their Z39.50 user interface. Furthermore, contrary to popular belief a decade ago, libraries participating in the DLF usage and usability survey no longer believe that one well-designed user interface can meet the needs and expectations of diverse user groups. Diversity has many different meanings in terms of library users, and each meaning potentially entails special collection or service needs, for example, different levels of experience using traditional or digital library resources (novice, expert), different status in the institution (undergraduate student, graduate student, faculty), different locations of use (outside or inside of the library facilities), different learning or physical disabilities (dyslexia, or impaired vision, hearing, mobility, or dexterity), and different ethnic or cultural assumptions and practices. Libraries are considering or implementing different approaches to support diverse user communities. Some are providing a customized library Web site user interface for each user group (e.g., students and faculty). Others are providing a personalized Web sites user interface for each individual. Even if the approach to the libraries' Web sites is still "one size fits all," libraries are committing considerable human and financial resources to the design, implementation, and maintenance of their Web sites and the Web interfaces to digital collections they create or manage locally. The resource commitment includes a substantial investment in conducting user and usability studies related to library collections and services. Beyond the interfaces that libraries create and maintain is a plethora of other user interfaces. The library Web site serves as a portal or gateway to licensed information products and other resources with interfaces that may or may not be customizable by the library. In cases where customization is possible, librarians are frustrated by what they cannot customize to meet the needs and expectations of their user communities - needs and expectations discovered through user and usability studies.

Empirical data and anecdotal evidence indicate that undergraduate students are enamored with the surface Web, and unable or unwilling to evaluate the appropriateness of resources for use in their assignments. Course management software like BlackBoard exacerbates the problem by linking to resources that have not been vetted by librarians. The growing concern among librarians participating in the DLF usage and usability survey is that many undergraduate students may be searching only a small portion of the surface Web to complete their assignments, ignoring entirely the deep Web and the books, journals, databases, full-text digital resources and other scholarly materials provided by the library. The consensus appears to be that undergradu-

ates are using library collections and services less than in the past because access to the surface Web is easy and convenient and because they assume that everything – or at least everything relevant or up-to-date – is available on the Web. Librarians and faculty are concerned that the quality of information and tools on the surface Web imperils the quality of student learning. How do we guide students to and get them to use appropriate resources, regardless of format? And whose job is it to provide such guidance and motivation – librarians or faculty or (ideally) some melting-pot brotherhood and sisterhood of both? Whoever assumes this responsibility, one thing is clear from the DLF survey. To support undergraduate students, we need to study them in their environment, not ours. Academic librarians need to know how undergraduates find and use information and why. This information would provide a context for interpreting the data we have on shifting patterns of library use and facilitate the development of collections, services, and tools that meet the needs and expectations of undergraduate students. Unfortunately, though perhaps understandably, library user studies focus on the use and usability of library collections, services, and Web sites. The larger environment remains unexplored – so we know *how* undergraduate use of the library is changing, but not *why*.

Research indicates that users are often unaware of the resources the library provides. In an environment of escalating costs and pressure to account for expenditures, advertising has become a critical imperative. Competition, the speed of change, and the well-known importance of reaching users at point of need compel libraries to invest human and financial resources in continuously promoting their collections and services to their different constituencies. Such marketing requires an investment of human and financial resources.

The focus on serving users necessarily leads to a focus on assessment. Libraries are conducting research to assess service quality, patterns of use, the usability of Web user interfaces, and user needs, expectations, and satisfaction with library collections and services. To a lesser extent, they are trying to assess the cost-effectiveness and cost-benefits of library resources and operations, the impact of marketing efforts to increase user awareness of library resources, and the impact that using library resources has on users. The emerging culture of assessment quickly leads to discussion of statistics and data points. The results of the DLF usage and usability survey indicate significant challenges to be addressed in the imminent future. Survey participants shared four areas of common ground concerning data:

- Conducting assessments that collect meaningful, purposeful data
- Developing the skills to conduct, analyze, present, and use the results of various assessments
- Managing the data collected from assessments

- Appropriately organizing the library to conduct and use the results of assessments effectively

Libraries are struggling to find the right measures to inform their decisions. Participants in the DLF survey expressed concern that data are being gathered for historical reasons or because they are easy to gather rather than because they serve useful, articulated purposes. Many sites participating in the survey are considering, beginning, or completing examinations of the data they currently gather or think they should gather for internal and external purposes. Libraries need to compile measures that capture the extent of their activities in both the digital and traditional realms. Much of the discussion about “right” measures focuses on usage data. Composite measures are needed to get a clear picture of library use, for example, totaling the number of visits to the physical library (gate counts) and the number of virtual visits to the digital library (Web site visits). Immediately the issues of definition and difficulty arise. What constitutes a virtual visit and how do we capture the data? To date, emerging new measures appear to have limited penetration in even leading digital libraries. Though the consensus is that librarians should decide what constitutes meaningful data in a hybrid library environment, not university administrators, accreditation or other outside agencies, libraries want national guidelines for what and how to count. Echoing discussion at the February 2001 NISO Forum on Performance Measurement and Statistics for Libraries, participants in the DLF usage and usability survey commented that life would be easier if professional surveys like those conducted by ARL, ACRL, and IPEDS defined and measured the same activities. Similarly, librarians are frustrated that information vendors do not define and measure the same activities in regard to their products. To track trends and make informed decisions, we need comparable usage data on resources provided by the library, by commercial vendors, and by other information service providers. We also need environmental measures to provide a context in which to interpret trends in library use.

Even if libraries know what the right measures are for their purposes, developing the requisite skills to conduct, analyze, present, and apply the measures is a separate challenge. Collecting data is one thing – sometimes software can do it. Working with the data is another. Analyzing, interpreting, presenting, and applying the data in meaningful ways require different skills from data collection. Participants in the DLF survey said they need methodological guidance. Libraries must invest financial resources in training and professional development, and dedicate or designate human resources to gather, verify, analyze, interpret, present, and apply data. The focus of this discussion is not usage data, but users and usability. Comments about usability testing ran the gamut from “we don’t do usability testing but know we should – please tell us

how” to descriptions of fledgling or well-organized usability testing programs and laboratories. Participants from many of the institutions expressed a need to know *what* research methods are available to assess user needs and expectations and the usability of Web user interfaces, and *which* methods are best suited for which purposes. They want instruction in how to use quantitative and qualitative data to make informed, effective – rather than intuitive – decisions and strategic plans. In response to this discussion, a workshop on research methods for conducting user and usability studies was held at the DLF Forum in San Francisco, California, May 2001.

Managing the data collected from various assessments is yet another serious challenge. Participants in the DLF survey questioned whether the sheer volume of data being gathered prohibits its careful analysis and whether data are being used to their full advantage. Participants from several institutions commented that they spend lots of time gathering data, but don’t have the time or talent to do anything with the results. Librarians need a simplified way to record and analyze data, and to generate statistical reports and trend lines. They are beginning to think about systems to manage the assessment data they gather, which raises questions about how long data should be kept, how it should be archived, and whether one system can or should manage the data from different kinds of assessments. Developing a “management information system” is a huge, expensive task, which unfortunately is being replicated at multiple institutions. One wonders why a commercial library automation vendor has not seized the opportunity to market a product that at the very least manages the standard library input and output measures, or the opportunity to work with librarians to understand, define, and develop a system to manage data needed for other quantitative measures, like cost-effectiveness. Statistical work is essential, time-consuming, and costly – so costly that librarians are beginning to question, and in some cases measure, the costs and benefits of gathering and analyzing different data. The local costs of gathering, analyzing, managing, interpreting, presenting, and applying data in effective ways, not to mention the cost of training and professional development required to accomplish these tasks, could exceed the cost of purchasing a commercial library data management system, were such a system available. The market for such a system would probably be large enough that a savvy vendor who made it affordable would also make it profitable.

The results of the DLF usage and usability survey indicate that individually, libraries aren’t organized internally in a manner appropriate to gathering, analyzing, or using assessment data strategically or cost-effectively. Often there is a breakdown in a process that should flow seamlessly from the decision about needing information, to data collection, analysis, interpretation, and use in planning. The result is a kind of pur-

poseless data collection. Collectively, libraries have been unable to surface methods, common standards or definitions, and guidelines to use the methods, which are needed for comparing the results of assessments across institutions. This may have something to do with the fact that library use and library roles are too much in transition, or there may be something organizationally wrong within libraries. Maybe it’s both. The fact of the matter is that libraries have diverse practices in a transitional world. We are trying to measure things that are hard to define because they are changing rapidly. The final area of common ground among the DLF survey participants was reorganizing the library to accommodate digital library developments and the changes in work and workflow precipitated by information technologies. Several sites have created new positions – usually from open positions, not new budget lines – to conduct research, establish research agendas or programs, design Web user interfaces, coordinate the gathering of statistics, or assess organizational effectiveness. New organizations, work, and workflow precipitate increased investment in staff training and professional development, covering the gamut of management and leadership skills, assessment methods, data analysis and presentation tools, customer service, and technical competencies. At some institutions user studies are centralized and performed by recently hired experts in the field. At others, it is system-wide, involving efforts to teach librarians and staff throughout the organization how to conduct research using different research methods. The overall trend is to create a culture of assessment focused primarily on meeting user needs and expectations and secondarily on the cost-effectiveness and efficiency of library operations. However, frustrations abound because of the speed of change and constraints on human and financial resources. Libraries urgently need research results that will generalize to avoid the cost of duplicated efforts.

Study of the Dimensions and Use of the Scholarly Information Environment

The DLF commissioned the white paper – referenced earlier in this article as elaborating the problem of understanding how and why libraries are changing – to establish a sense of urgency and motivate selected library directors from small liberal arts colleges, mid-size and large universities to attend a meeting convened by the DLF and CLIR in March 2001. This group accepted the role of guiding coalition and the task of designing research to begin to fill the gaps in our understanding of how and why libraries are changing.

The range of changes that libraries are experiencing and the many environmental factors that must be explored to explain them are too broad for a single research study to address. To help decide where we should begin, the DLF conducted an informal survey prior to the March meeting to discover what library

directors considered high priority areas for data collection and research. The survey, distributed to DLF library directors and the directors invited to the March meeting, asked participants to list their five top reasons for documenting trends in library use, the audiences to be addressed in each of the five areas, and the key indicators of use that must be taken into account in each of the five areas.

Library directors did not strictly adhere to the instruction to provide reasons for documenting trends in library use, but rather provided their five top reasons, audiences, and indicators for conducting assessments of any kind. The results easily grouped into four areas of focus closely resembling the Balanced Score Card (BSC) categories. (For an introduction to the BSC, see [http://library .nepean.uws.edu/au/about/staff/gegan/balscore .html](http://library.nepean.uws.edu/au/about/staff/gegan/balscore.html) and <http://educate.lib.chalmers.se/IATUL/proceedcontents/chanpap/gerryts.html>.)

DLF Survey Results	Balanced Score Card
User studies - to meet user needs and expectations	Customer or client perspective
Cost analyses - to allocate expenditures to meet user needs and expectations cost-effectively	Financial & internal processes perspectives
Expenditures & funding - to validate expenditure of existing funds and strategic planning requests for additional funds	Financial & internal processes perspectives
Human resources - to recruit and retain competent librarians and staff	Learning & growth perspective

Library directors at the March 9th meeting explored research aims, audiences, goals, and possible starting points drawn from the survey results. The DLF and CLIR proposed that participants reach consensus on collecting and analyzing comparable trend data on the nature, cost, and use of selected library collections, services, and facilities, and the use of complementary and competing collections, services, and facilities offered by agencies other than the library (on or off campus). The proposal included considering commissioning research to examine how students and faculty locate and use scholarly information and information services and/or how curricula and methods of instruction shape student and faculty information seeking and related behaviors. The library directors quickly agreed that the highest priority research to be conducted was an assessment of the dimensions and use of the scholarly information environment as perceived by students and faculty. Librarians need to know more about how academic users find and use information to meet their needs and expectations for information.

The outcome of the March meeting was an agreement to commission Outsell Inc. to survey academic

users. The research will contribute empirical evidence to our currently speculative understanding of the overall information environment, how academic users view the library's role or position in this environment, and how user behaviors and preferences affect demand for and use of library collections, services, and facilities. Plans are for Outsell Inc. to conduct quantitative telephone interviews of faculty, graduate students, and undergraduate students in different disciplines in liberal arts colleges and public and private universities to discover

- What information and services they use to support research, teaching, and learning;
- How different user groups locate, evaluate, and use these information sources and services
- Gaps where information needs are not being met.

This baseline understanding of user behaviors will help academic libraries and their institutions plan information services focused on the current and emerging needs of their users, and avoid investing in what is not, or is no longer, important to them. The data will facilitate evaluation of the library's current and possible future roles in the information landscape, and provide essential contextual information for interpreting trends in the use of library resources. The results of the study will also benefit the academic community by helping publishers and other information providers create better information products based on increased knowledge of user needs, preferences, and behaviors.

A small group of experts will meet August 24, 2001, in Washington DC to finalize the survey questions. The questions will be designed to test five hypotheses:

1. The scholarly information landscape is a complex and evolving combination of information resources, only some of which are managed by academic libraries.
2. Academic libraries have a distinct and vital role to play in the evolving networked information landscape.
3. Academic libraries must promote themselves in the networked environment because they are not the only or most accessible provider of scholarly information in this environment.
4. The nature and use of the scholarly information landscape varies by institution type and academic discipline.
5. Information use is conditioned by many factors, including speed of access, ease of use, and the quality of the resource.

Outsell Inc. will conduct the research and submit the reports by February 2002. The reports will be publicly accessible on the DLF web site, and the data gath-

ered during the study will be accessible for non-commercial use through the Inter-University Consortium for Political and Social Research (ICPSR). Following the study, the DLF will collaborate with library directors in the guiding coalition to assess how the research results help explain trends in library use and how the results can be applied to strategic, organizational, financial, and human resource planning for academic libraries. A few brief case studies will be prepared to demonstrate how an enhanced understanding of the academic information landscape and its use can facilitate interpretation of trend data and inform plans for collections, services, and facilities.

Discerning Patterns in Library Priorities and Practices

Tentative plans are to adapt the informal survey of library directors described above to discover whether librarians in different departments and at different levels in the organizational hierarchy have similar perceptions, priorities, practices, and problems related to the gathering and use of data. As with the survey of library directors from small colleges and mid-size and large universities, though local strategic plans and institutional missions admittedly influence assessment priorities and practices, the results of such a survey may surface:

- Commonalities across departments and organizational levels that suggest areas for collective effort, problem solving, and the development of best practices.
- Discrepancies across departments and organizational levels that suggest areas for improved communication, coordination, and planning.