# E-Resources: Current Issues in Measuring Electronic Use in Libraries

National Seminar on Electronic Resources in Malaysia

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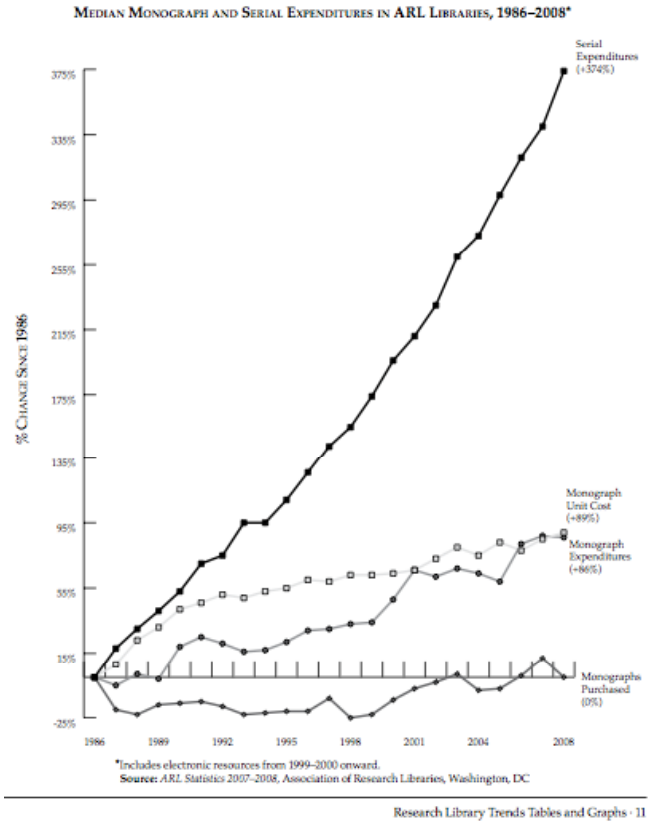
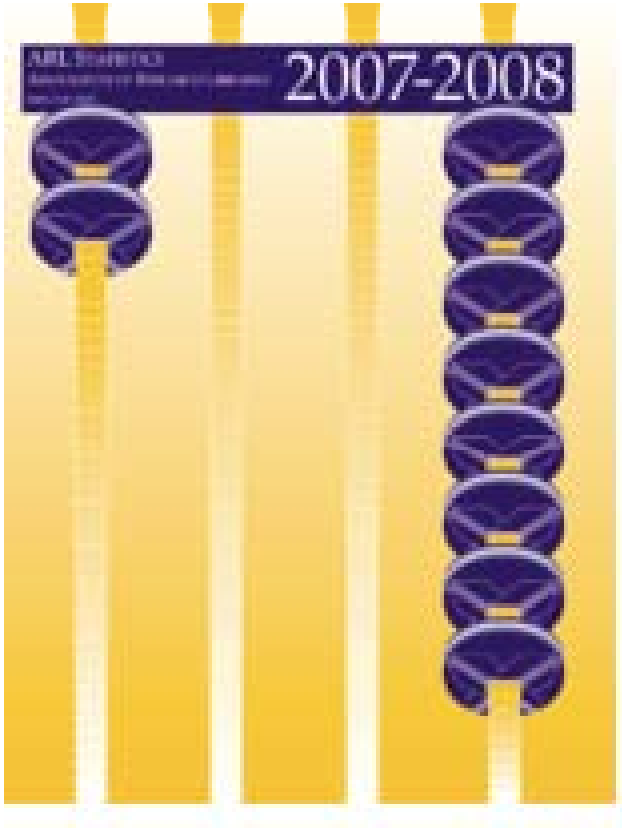
# A Decade of Challenges

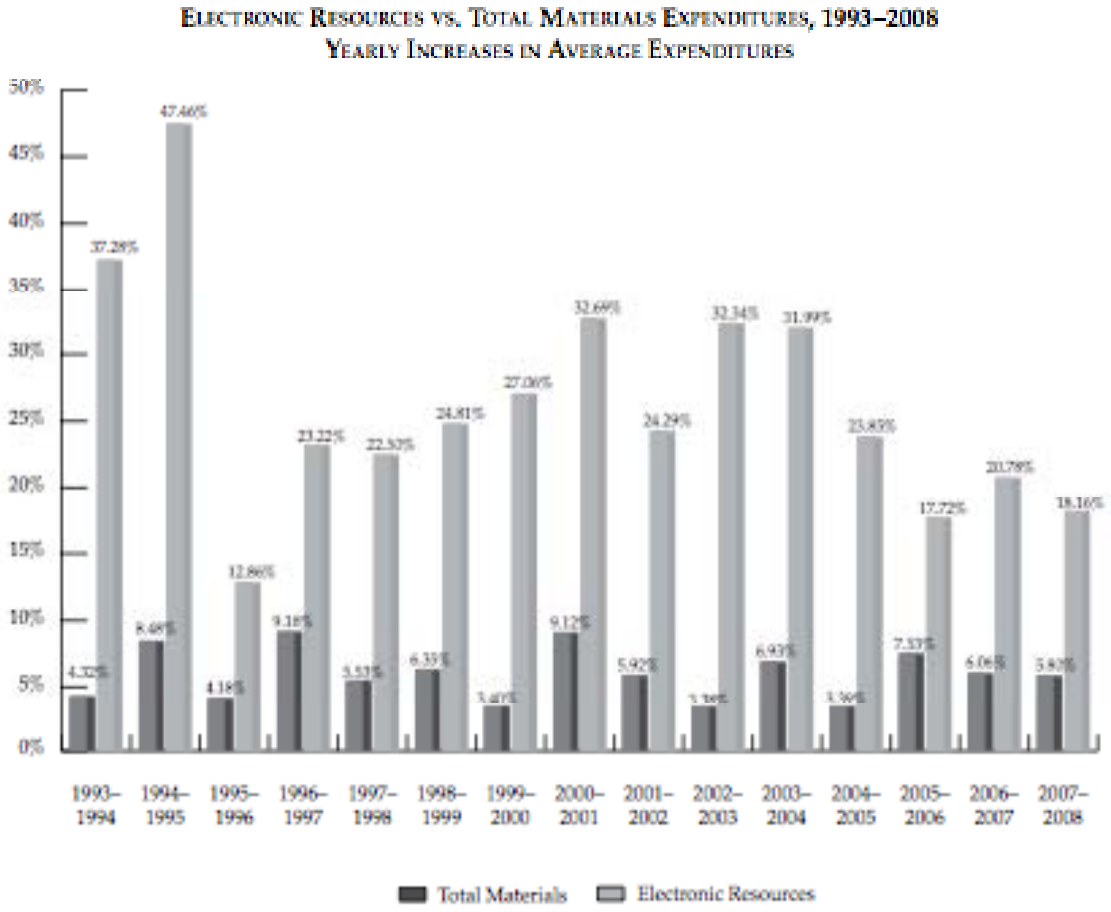
- Demand for libraries to demonstrate outcomes/impacts in areas of importance to institution
- Pressure to maximize use of resources through benchmarking resulting in:
  - Cost savings
  - Reallocation

# Electronic Serials Expenditures



# Average Yearly Increases in Electronic Resources and Total Library Materials Expenditures

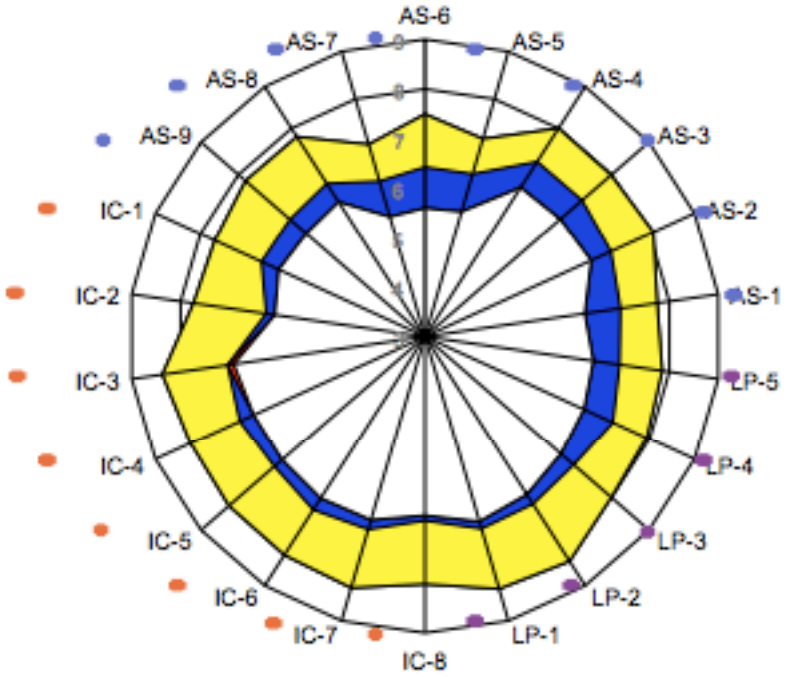


# ARL New Measures Projects

- Demonstration project for service effectiveness measures (LibQUAL+®)
- Project to define usage measures for electronic information resources (E-metrics)

LibQUAL+®

Charting Library Service Quality



# Statistics and Data Needs for Electronic Information

- Financial Support
- Infrastructure
- Comparisons
- Vendor Negotiation

# ARL E-Metrics Project

Three phases:

- Initial Phase (May-October 2000): **What do we know?** Inventory of current practices at ARL libraries as to statistics, measures, processes, and activities that pertain to networked resources and services.
- Second Phase (November 2000-June 2001): **What can we collect?** Identified and field tested an initial draft set of statistics and measures
- Final phase (July 2001-December 2001): **What difference does this make?** Build linkages to: educational outcomes/impact, research, technical infrastructure

# Recommended Statistics & Measures

- Patron Accessible Electronic Resources
- Use of Networked Resources & Services
- Expenditures for Networked Resources & Related Infrastructure
- Library Digitization Activities
- Performance Measures

# Patron Accessible Electronic Resources

- Number of electronic full-text journals
- Number of electronic reference sources
- Number of electronic books

# Use of Networked Resources & Related Infrastructure

- Number of electronic reference transactions
- Number of logins (sessions) to electronic databases
- Number of queries (searches) in electronic databases
- Items requested in electronic databases
- Virtual visits to library's website and catalog

# Expenditures for Networked Resources & Related Infrastructure

- Cost of electronic full-text journals
- Cost of electronic reference sources
- Cost of electronic books
- Library expenditures for bibliographic utilities, networks & consortia
- External expenditures for bibliographic utilities, networks & consortia

# Library Digitization Activities

- Size of library digital collection
- Use of library digital collection
- Cost of digital collection construction & management

# Performance Measures

- Percentage of electronic reference transactions of total reference
- Percentage of virtual visits of all library visits
- Percentage of electronic books to all monographs
- *Percentage of electronic journals to serial subscriptions [note: serials now counted by title, rather than subscriptions]*

# Project Documents

- Measures for Electronic Resources (E-Metrics)
  - Part 1: Project Background and Phase One Report
  - Part 2: Phase Two Report
  - Part 3: E-Metrics Instructional Module
  - Part 4: Data Collection Manual
  - Part 5: Library and Institutional Outcomes
- www.arl.org/stats/initiatives/emetrics/index.shtml

# Decade of Learning

- Agreement on what to count is hard
  - Change from serial subscriptions to titles
  - Ebooks
- Complexity of systems and interfaces
- Packages/bundles complicate use counts for specific resources
- Comparisons across institutions difficult when part of consortia
- Digitization projects dependent on environment

COUNTER

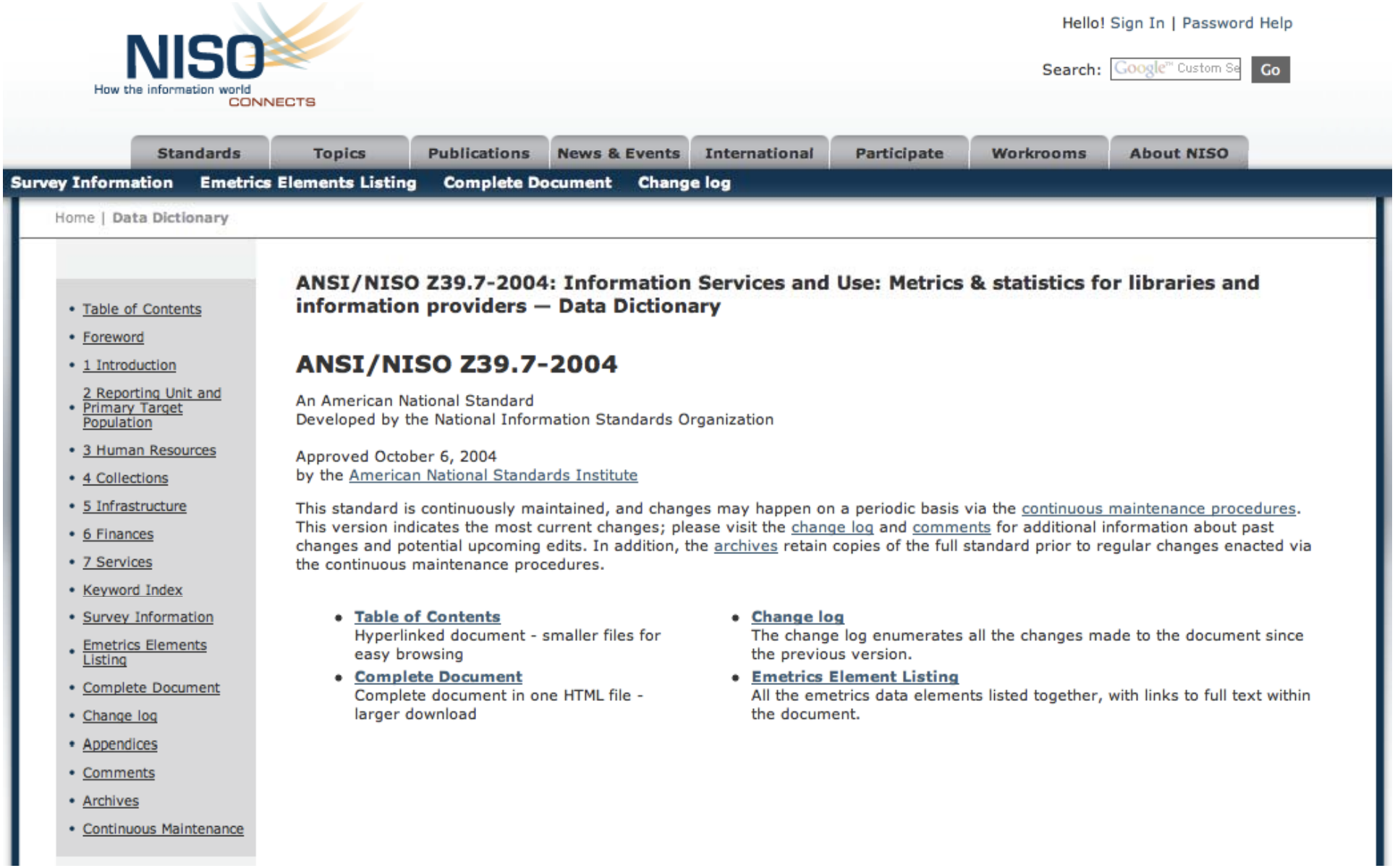
Counting Online Usage of NeTworked Electronic Resources



## About COUNTER

Launched in March 2002, COUNTER (**C**ounting **O**nline **U**sage of **N**etworked **E**lectronic **R**esources) is an international initiative serving librarians, publishers and intermediaries by setting standards that facilitate the recording and reporting of online usage statistics in a consistent, credible and compatible way. The first COUNTER Code of Practice, covering online journals and databases, was published in 2003. COUNTER.s coverage was extended further with the launch of the Code of Practice for online books and reference works in 2006. The body of COUNTER compliant usage statistics has steadily grown as more and more vendors have adopted the COUNTER Codes of Practice. This has contributed to the new discipline of usage bibliometrics and a great deal of work is underway to try to establish .value metrics. associated with usage, in which the COUNTER compliant statistics play an increasingly important role..

COUNTER does more than just set the standards for usage reports; we are co-operating with a number of organizations to develop a range of usage-related research and services. In 2006 COUNTER carried out research, sponsored by JISC (the UK Joint Information Systems Committee) on the effects of publisher platforms on usage and we are currently collaborating with the UK Serials Group on the possible development of a new Journal Usage Factor metric. Summary reports on both these projects can be found on the COUNTER website at http://www.projectcounter.org/news.html . COUNTER has also worked with NISO on SUSHI (Standardised Usage Harvesting Initiative) to develop a protocol to facilitate the automated harvesting and consolidation of usage statistics from different vendors. This protocol may be found on the NISO website at http://www.niso.org/schemas/sushi/index.html#COUNTER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Appendices
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ANSI/NISO Z39.7-2004: Information Services and Use: Metrics & statistics for libraries and information providers — Data Dictionary
ANSI/NISO Z39.7-2004
An American National Standard
Developed by the National Information Standards Organization
Approved October 6, 2004
by the American National Standards Institute
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Home | Workrooms | Standardized Usage Statistics Harvesting Initiative (SUSHI)

- SUSHI Homepage
- SUSHI Standard (Z39.93-2007)
- Errata for Appendix G: Security Considerations
- SUSHI FAQs
- Getting Started
- SUSHI Tools
- SUSHI Schemas
- SUSHI Reports Registry
- SUSHI Server Registry
- SUSHI Press & Presentations
- SUSHI Committee Roster
- SUSHI Developers List

# Standardized Usage Statistics Harvesting Initiative (SUSHI)

## SUSHI Standing Committee Quarterly Report Released (August 31, 2010)

- About SUSHI
- **Join the SUSHI Developers Email List!**
- About COUNTER

## About SUSHI

The *Standardized Usage Statistics Harvesting Initiative (SUSHI) Protocol* standard (**ANSI/NISO Z39.93-2007**) defines an automated request and response model for the harvesting of electronic resource usage data utilizing a Web services framework. It is intended to replace the time-consuming user-mediated collection of usage data reports.

The protocol was designed to be both generalized and extensible, meaning it could be used to retrieve a variety of usage reports. An extension designed specifically to work with COUNTER reports is provided with the standard, as these are expected to be the most frequently retrieved usage reports.

The standard is built on SOAP (Simple Object Access Protocol) for transferring request and response messages. The *GetReport* method is used for transferring *ReportRequest* as the input message and returning *ReportResponse*as the output message.

The standard includes a versioned Web Services Description Language (WSDL), to describe the Web service namespace and operations, and a generalized XML schema with the syntax of the SUSHI protocol. Rules for report naming are outlined and complemented by an external reports registry, which provides for the definition of both COUNTER and non-COUNTER reports.

# The PIRUS2 Project

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**Funded by**

JISC

Funding programme: Information Environment Programme 2009-11

## PIRUS2

PIRUS2, sponsored by JISC (the United Kingdom Joint Information Systems Committee) builds on the outcomes and recommendations of the original PIRUS (Publisher and Institutional Repository Usage Statistics) project, also funded by JISC, which was completed in January 2009. The full report of the original PIRUS project may be found at: http://tinyurl.com/PIRUSreport1

The original PIRUS project demonstrated that it is technically feasible to create, record and consolidate usage statistics for individual articles using data from repositories and publishers, despite the diversity of organizational and technical environments in which they operate. If this is to be translated into a new, implementable COUNTER standard and protocol, further research and development will be required, specifically in the following areas:

- Technical: further tests, with a wider range of repositories and a larger volume of data, will be required to ensure that the proposed protocols and tracker codes are scalable/extensible and work in the major repository environments.
- Organizational: the nature and mission of the central clearing house/houses proposed in the original project has to be developed, and candidate organizations identified and tested
- Economic: we need to assess the costs for repositories and publishers of generating the required usage reports, as well as the costs of any central clearing house/houses; investigate how these costs could be allocated between stakeholders
- Advocacy: the broad support of all the major stakeholder groups (repositories, publishers, authors) will be required. Intellectual property, privacy and financial issues will have to be addressed

The objective of PIRUS2 is to address these issues and by doing so specify standards, protocols, an infrastructure and an economic model for the recording, reporting and consolidation of online usage of individual articles hosted by repositories, publishers and other entities.

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# MESUR: MEtrics from Scholarly Usage of Resources

## Project objectives:

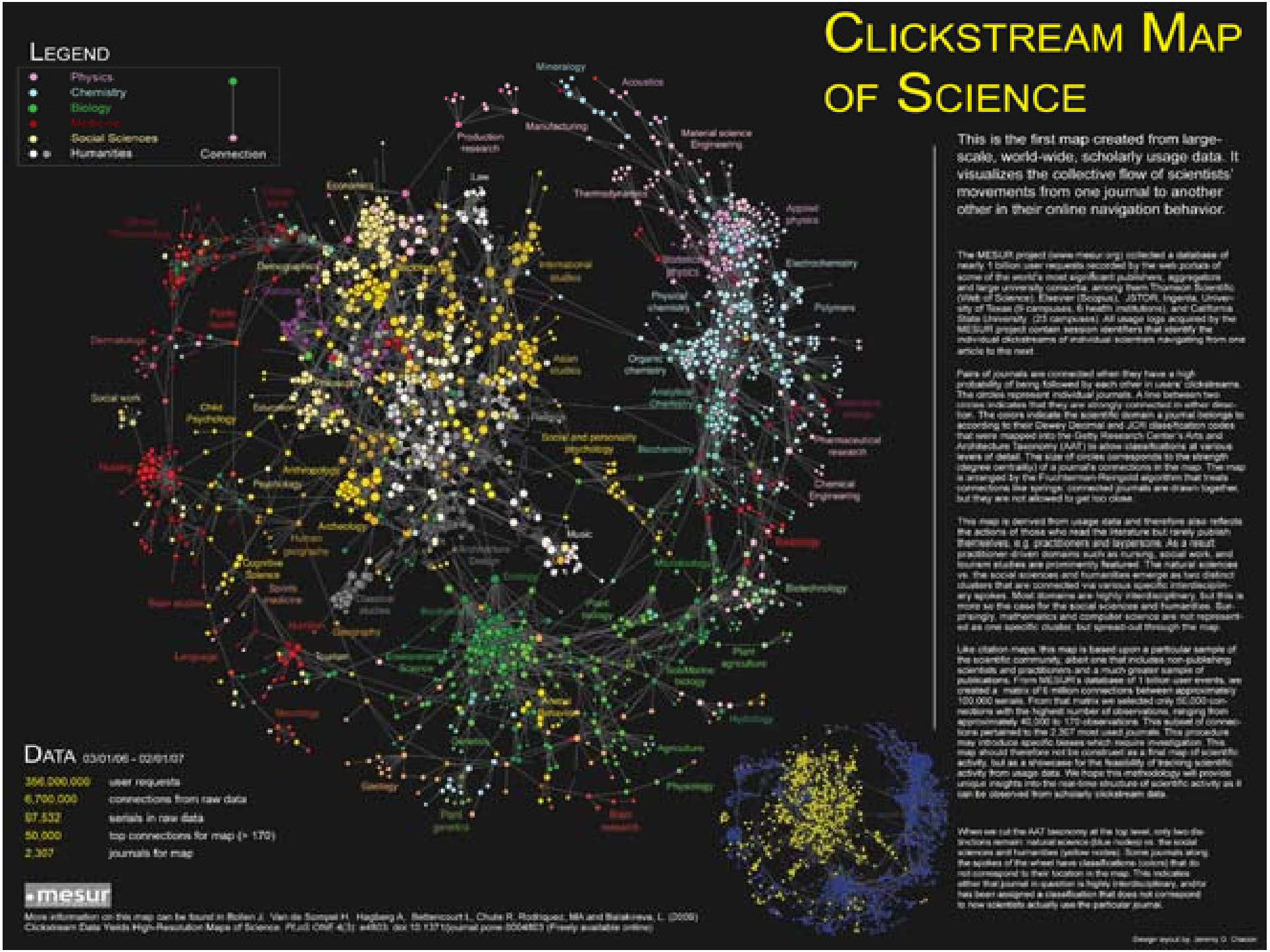
The project's major objective is enriching the toolkit used for the assessment of the impact of scholarly communication items, and hence of scholars, with **metrics that derive from usage data**. The project has created a **semantic model of the scholarly communication process**, and an associated **large-scale semantic store** that relates a range of bibliographic, citation and usage data obtained from a variety of sources. After **mapping the structure of the scholarly community** on the basis of the established reference data set, MESUR will conduct an investigation into the **definition and validation of a range of usage-based metrics**. The defined metrics will be cross-validated, resulting in the formulation of **guidelines and recommendations**.

## The MESUR data base:

## Quick facts:

**Funding:** The Andrew W. Mellon Foundation
**Timeline:** October 2006 - October 2008
**Principal investigator:** Johan Bollen
**Institution:** Los Alamos National Laboratory
**Team:** Digital Library Research & Prototyping Team of the LANL Research Library
**People: Johan Bollen** is the Principal Investigator, **Herbert Van de Sompel** serves as an architectural consultant, and **Aric Hagberg** of the LANL Mathematical Modeling and Analysis group serves as modeling consultants. **Marko A. Rodriguez**, a recent PhD graduate at the University of California Santa Cruz and now LANL post-doc at the LANL Center for Non-Linear Science, has supported the project's research and development. **Ryan Chute** of the LANL Research Library is now the project's main developer and database manager.

# Clickstream Map of Science




This is the first map created from large-scale, world-wide, scholarly usage data. It visualizes the collective flow of scientists' movements from one journal to another other in their online navigation behavior.

The MESUR project (www.mesur.org) collected a database of nearly 1 billion user requests recorded by the web portals of some of the world's most significant publishers, aggregators and large university consortia, among them Thomson Scientific (Web of Science), Elsevier (Scopus), JSTOR, Ingenta, University of Texas (9 campuses, 6 health institutions), and California State University (23 campuses). All usage logs acquired by the MESUR project contain session identifiers that identify the individual clickstreams of individual scientists navigating from one article to the next.

Pairs of journals are connected when they have a high probability of being followed by each other in users' clickstreams. The circles represent individual journals. A line between two circles indicates that they are strongly connected in either direction. The colors indicate the scientific domain a journal belongs to according to their Dewey Decimal and JCR classification codes that were mapped into the Getty Research Center's Arts and Architecture Taxonomy (AAT) to allow classifications at various levels of detail. The size of circles corresponds to the strength (degree centrality) of a journal's connections in the map. The map is arranged by the Fruchterman-Reingold algorithm that treats connections like springs: connected journals are drawn together, but they are not allowed to get too close.

This map is derived from usage data and therefore also reflects the actions of those who read the literature but rarely publish themselves, e.g. practitioners and laypersons. As a result practitioner-driven domains such as nursing, social work, and business studies are prominently featured. The natural sciences vs. the social sciences and humanities emerge as two distinct clusters that are connected via various specific interdisciplinary spokes. Most domains are highly interdisciplinary, but this is more so the case for the social sciences and humanities. Surprisingly, mathematics and computer science are not represented as one specific cluster, but spread-out through the map.

Like citation maps, this map is based upon a particular sample of the scientific community, albeit one that includes non-publishing scientists and practitioners and a much greater sample of publications. From MESUR's database of 1 billion user events, we created a matrix of 6 million connections between approximately 100,000 serials. From that matrix we selected only 50,000 connections with the highest number of observations, ranging from approximately 40,000 to 170 observations. This subset of connections pertained to the 2,307 most used journals. This procedure may introduce specific biases which require investigation. This map should therefore not be construed as a final map of scientific activity, but as a showcase for the feasibility of tracing scientific activity from usage data. We hope this methodology will provide unique insights into the real-time structure of scientific activity as it can be observed from scholarly clickstream data.



When we cut the AAT taxonomy at the top level, only two divisions remain: natural science (blue nodes) vs. the social sciences and humanities (yellow nodes). Some journals along the spokes of the wheel have classifications (colors) that do not correspond to their location in the map. This indicates either that journal in question is highly interdisciplinary, and/or has been assigned a classification that does not correspond to how scientists actually use the particular journal.

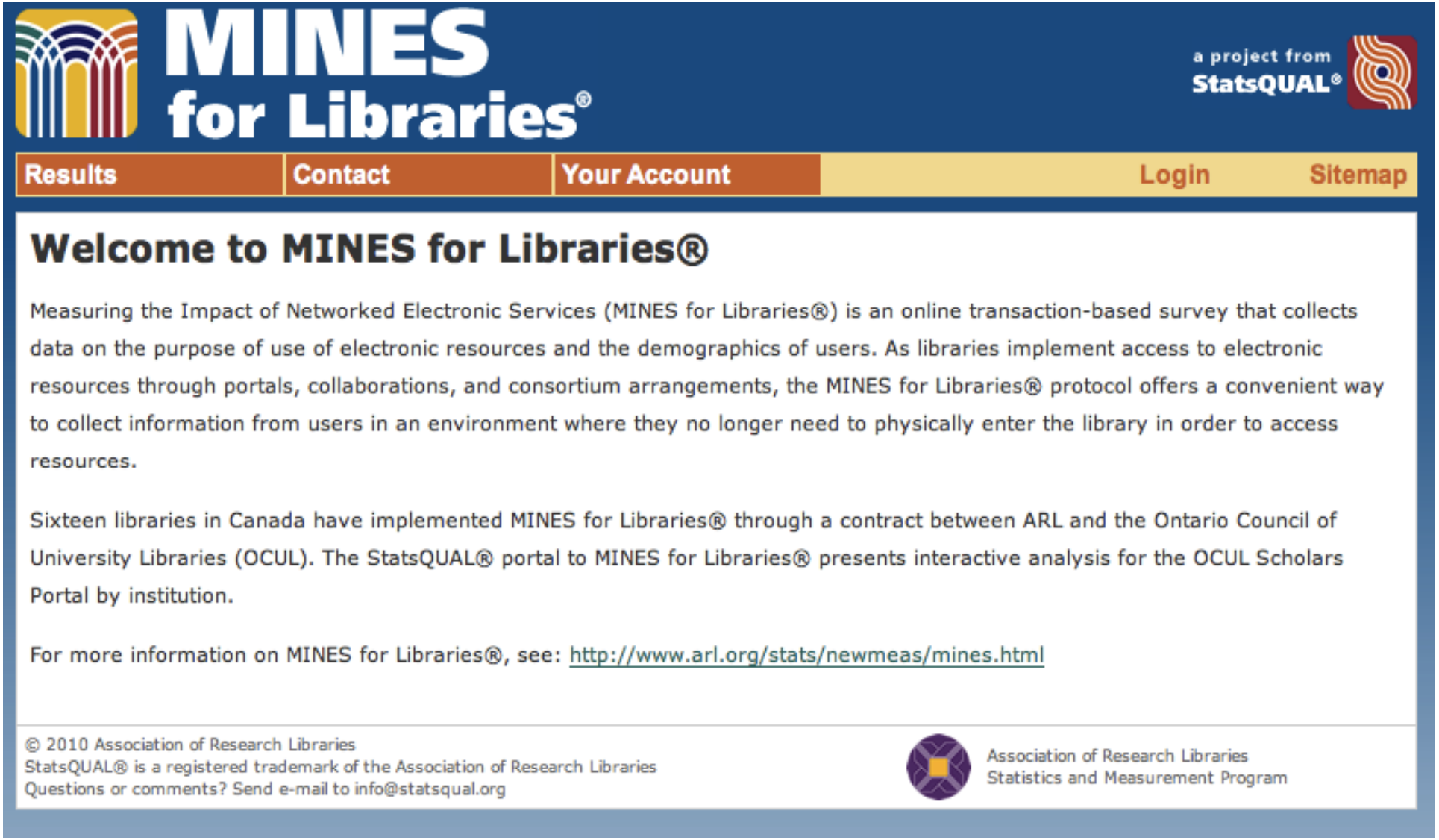
## Data 03/01/06 - 02/01/07

| | |
|---|---|
| 396,000,000 | user requests |
| 6,700,000 | connections from raw data |
| 97,532 | serials in raw data |
| 50,000 | top connections for map (> 170) |
| 2,307 | journals for map |

•mesur

More information on this map can be found in Bollen J, Van de Sompel H, Hagberg A, Bettencourt L, Chute R, Rodriguez, MA and Balakireva, L. (2009) Clickstream Data Yields High-Resolution Maps of Science. PLoS ONE 4(3): e4803. doi:10.1371/journal.pone.0004803 (Freely available online)

Design layout by Jeremy G. Chacon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Measuring the Impact of Networked Electronic Services (MINES for Libraries®) is an online transaction-based survey that collects data on the purpose of use of electronic resources and the demographics of users. As libraries implement access to electronic resources through portals, collaborations, and consortium arrangements, the MINES for Libraries® protocol offers a convenient way to collect information from users in an environment where they no longer need to physically enter the library in order to access resources.
Sixteen libraries in Canada have implemented MINES for Libraries® through a contract between ARL and the Ontario Council of University Libraries (OCUL). The StatsQUAL® portal to MINES for Libraries® presents interactive analysis for the OCUL Scholars Portal by institution.
For more information on MINES for Libraries®, see: http://www.arl.org/stats/newmeas/mines.html
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# Continuing Challenges

- Definitions
- Vendor systems
- Bundles/packages
- Consortial services
- Freely accessible titles
- Digitization projects

# Links

- http://www.arl.org/stats/initiatives/index.shtml
- http://www.projectcounter.org/
- http://www.niso.org/dictionary
- http://www.niso.org/workrooms/sushi
- http://www.cranfieldlibrary.cranfield.ac.uk/pirus2/tiki-index.php
- http://www.mesur.org/MESUR.html

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