

Evaluation of the National Science Digital Library

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See acknowledgements for full list.

ABSTRACT

This article describes a community-based process for developing shared instruments to begin evaluating the National STEM Digital Library (NSDL). A pilot study based on these instruments is currently underway and will be completed by the time of the JCDL workshop. The purpose of the pilot study is to examine library usage, collections growth, and library governance processes. The methods used in the pilot include web log usage analysis, collections assessment techniques, survey instruments, and semi-structured interviews. Preliminary results from the pilot evaluation of six existing libraries will be presented. The community-based process through which the shared pilot instruments were derived will also be discussed.

INTRODUCTION

The National STEM (Science, Technology, Engineering, and Mathematics) Digital Library (NSDL) is envisioned to be a comprehensive source for information, research and tools in science, technology, engineering and mathematics education. The NSF-funded NSDL program consists of over one hundred projects. Some are developing collections, others are developing library services, some are engaged in library research, and one large effort is charged with developing core integration services. These core services include a central portal to provide access to distributed educational resources and the social and technical infrastructure necessary for integrating distributed disciplinary libraries and collections. Thus, the NSDL can be thought of as a library network that can be characterized by the slogan "One Library, Many Portals."¹ The NSDL is currently under development, and it is envisioned that the central portal will be publicly available in December 2002.

Part of the social infrastructure for integrating the library includes a community governance process. This governance process includes working groups charged with providing formative input into library development in a number of areas including collections, policy, education, and evaluation. Evaluating the usefulness and usability of NSDL is challenging due to its distributed nature. That is, users are not interacting with a single system or artifact, they may arrive from a variety of entry points that are separately designed and managed. Within this distributed context, the NSDL Evaluation Working Group is attempting to develop shared instruments that work across a variety of libraries and programs to provide individual projects and the NSDL program as a whole with useful formative tools.

The NSDL must address traditional usability issues. The President's Information Technology Advisory Committee reports that 'any individual can participate in on-line

education programs regardless of geographic location, age, physical limitation, or personal schedule.'² Ease and manner of use by learners and educators are high priorities for the NSDL community. The usability challenge is to provide a coherent and meaningful user experience across distributed libraries, portals, and collections.

Additionally, the NSDL must address usability for some non-traditional user roles, such as distributed service developers, collections developers, librarians, etc. The goal of these particular usability studies is to determine the use and usability of the technical and social infrastructures in support of distributed library construction.

In an attempt to take preliminary steps to understand these complex usability issues, the NSDL Evaluation Working Group is conducting a pilot study to examine the following four questions:

- 1) How are people using the libraries?
- 2) How are collections growing/changing?
- 3) How well are the distributed library building and governance processes working?
- 4) What is the time and effort required, both centrally and at distributed sites, to participate in this evaluation? Do the results justify this effort?

These questions are being explored in a manner that addresses the current operating procedures for individual libraries within the NSDL. A long-term goal is to work towards developing evaluation standards and metrics that can be used within the design and implementation of a successful, working NSDL.

Overview of the NSDL Evaluation Pilot

The NSDL Evaluation Pilot ran for 3 months beginning 01 April 2002 and ending 30 June 2002. Six existing digital library projects volunteered to participate in this pilot study. This pilot will develop an initial evaluation strategy for the distributed NSDL regarding library building processes, library usage, and collections growth and quality. This strategy will be designed to work with distributed portals, libraries, collections and services, as well as the central portal. Additionally, formative evaluation information will be collected to better determine the technical, social, and cost issues inherent in this large-scale distributed effort.

Strategy

A variety of data collection techniques are being used (developed based on ARL metrics³ and D-Lib's Working

Group on Digital Library Metrics⁴). To examine the questions of library usage and collections growth, a suite of metrics and indicators were devised. The usage metrics and indicators are based on analyses of web server logs. These include metrics such as: Incoming Top-Level Domains; Total Number of Pages Served; Total Number of Pages Served by Library Function; Total number of queries; Number of null-result queries; etc. Collections growth metrics and indicators examine changes in the amounts and types of metadata records over the period of the pilot. These include metrics such as: Number of Item Records in the Collection; Intended Subjects for Entire Collection and number of items per subject. The full set of metrics are available in two spreadsheet instruments on the Evaluation Workgroup Site⁵. These were completed monthly, that is 3 times, during the pilot.

A survey instrument⁵ was used to examine the question surrounding library building and governance processes. This survey was administered to project personnel at each participating pilot site. An interview may be conducted with selected respondents as a follow-up measure.

The fourth area of emphasis concerns meta-evaluation. That is, did the results from the pilot justify the time and effort to participate? To answer this issue, questions that assess reporting effort and reporting problems have been built into the spreadsheets. In addition, a survey will be administered to pilot participants after the data-collection period to better understand perspectives on the utility of the study.

These shared instruments are in their formative stages and will be modified based on the results of the pilot.

The Process

The research questions, the study design, and the instruments are the result of a community design process. The vehicle for this process is the NSDL Evaluation Working Group, which is comprised of volunteers who are interested in digital library design and evaluation. Within this group, people have contributed their time to the design of the study, the design of the instruments, and data analysis. Other people have contributed their projects as pilot sites.

Through iterations of meetings, consensus building, and revisions of documents and instruments, the Evaluation Working Group has taken important steps towards creating a shared vision for evaluation as an integral activity within the NSDL. This consensual and participatory approach is crucial for enculturating evaluation activities and concerns within NSDL. Moreover, these activities help to focus outcomes and goals for the program as a whole.

Preliminary Results

Available at the workshop.

Future Steps

The short-term goal of the Evaluation Working Group is to revise the instruments and scale them up to broader numbers of participating sites, as well as to introduce new questions and metrics to address the concerns and priorities of the NSDL distributed system. Additionally, wider input is sought from the digital library community outside our specific project regarding their usability issues and concerns.

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