Developing an Enterprise-Wide Knowledge Management System Integrating Editorial Review Processes, a Digital Library, and Online Catalog

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INTRODUCTION

Selecting and implementing the appropriate strategies, technologies, and tools for an enterprise-wide knowledge management system can be a daunting task. Legacy systems that have outlived their ability to perform effectively and an organizational culture that runs counter to enterprise wide sharing of information can make the task seem formidable. This paper examines the issues we addressed in designing a system to capture, manage, store, preserve, and deliver NIST knowledge assets in the form of documents. Understanding the workflow that evolved as a result of difficulties with the legacy systems, ensuring that the new system adhered to NIST editorial review policies and procedures, and sensitivity to customer requirements and the existing organizational culture was of critical importance.
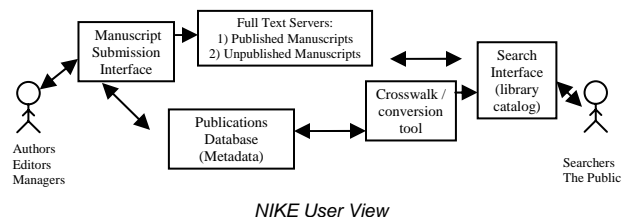
BACKGROUND

Reporting on the results of the NIST laboratory research activities has been an important part of the agency's mission since it's founding in 1901. NIST researchers use a variety of vehicles for reporting on their research. These include agency publications, conference presentations, and articles in scholarly journals produced by commercial publishers and professional societies. NIST researchers produce approximately 2,000 manuscripts targeted to agency or external publications each year.

NIST policy requires editorial review and approval of all technical manuscripts and "official writing" prior to submission for publication. The policy applies to manuscripts slated for an agency publication or for an external publication. This requirement includes review and approval within the originating operating unit or laboratory as well as review by the agency editorial review boards.[2]

NIST Integrated Knowledge EditorialNet (NIKE), designed by the National Institute of Standards and Technology (NIST) Information Services Division[3] will streamline NIST's complex manuscript review workflow and join it with an adapted legacy database of metadata and process information, an online catalog of MARC records, and a digital library of published documents. NIKE will enable NIST authors to track the editorial review of manuscripts. It will also enable researchers and the general public to find and access NIST scientific output. The project is currently in the first of two development phases.

SYSTEM OVERVIEW[4]

NIKE User View

Main Components:

- **Database**: A new Oracle database extending a pre-existing Access database. Tables store user, organizational, process, and metadata information.
- **Web Interface**: A newly designed Web interface that meets accessibility standards will be used for manuscript submission, editorial review and approval, manuscript tracking, locating records, and creating reports. The NIKE homepage provides announcements and information for users on a variety of topics.
- **Online Library Catalog**: The online catalog provides vocabulary authority control, a sophisticated search engine, and links within the MARC records to published documents in the digital library.
- **Crosswalk**: A software program using Perl scripting is being developed to automatically migrate the relevant data from the Oracle database to the online library catalog. The crosswalk will work seamlessly between the NIKE Oracle database and the integrated library system (Sirsi).
- **Servers**: Full-text manuscripts will be housed on a file server inside the NIST firewall. The full-text of published documents will reside on a web server outside of the firewall.

PLANNED RELEASES

Phase 1 (Fall 2005):
- Migration of data to new Oracle database
- Submission and tracking of manuscripts
- Report generation
- Crosswalk of bibliographic data to online catalog
- Digital Library of NIST "classic" and high demand documents
- Usability testing
- User training

Phase 2 (Fall 2006):
- Online peer review
- Electronic approval
- Electronic signatures
- Online revisions
- Usability testing
- User training
- Further development of Digital Library with use of DOIs.

NIKE DEVELOPMENT TEAM

A seven-member team from across the division was assembled to gather customer requirements from authors, managers, administrative staff, and the editorial review boards; look at the database systems developed by the labs and divisions; investigate commercially available software products; and write the business and technical requirements for the new system. The members of the team bring a variety of expertise and experience to the task.

The team consists of a knowledge management librarian who is also the team leader, librarian/web manager, the library's Sirsi system administrator, a librarian/cataloger, a writer/editor who is a web expert and also the Assistant WERB Secretary, and a printing specialist who has expertise in scanning and document composition for the Web environment. The EIPG group leader is also part of the team in a consulting capacity.

The Information Systems Group of Technology Services is providing software development and hardware support.

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[1] The National Institute of Standards and Technology (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." The NIST Laboratories, located in Gaithersburg, MD and Boulder, CO 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.

[2] The Washington Editorial Review Board (WERB) in Gaithersburg and the Boulder Editorial Review Board (BERB) in Boulder are official NIST standing administrative committees responsible to the NIST Director. There are 24 members of WERB and 8 members of BERB, representing the NIST laboratories at each location.

[3] The Information Services Division (ISD) consists of the NIST Research Library, the NIST Museum, and the Electronic Information and Publications group (EIPG). Among its many publications-related activities, EIPG serves as the Secretariat for the agency's editorial review board (WERB) at the Gaithersburg, MD location. This function includes tracking manuscripts as they go through the editorial review process and maintaining a bibliographic database of manuscript information. The NIST Research Library maintains a collection of about 300,000 volumes and over 1,000 journal subscriptions. The collection also includes approximately 6,000 agency publications. Bibliographic information about these agency publications is maintained in the library's online catalog accessible to both NIST staff and external customers through the NIST Virtual Library (NVL).

[4] The mention of specific commercial products is not intended to imply recommendation or endorsement by the National Institute of Standards and Technology (NIST).