NEW HORIZONS IN AGRICULTURAL INFORMATION MANAGEMENT

PROCEEDINGS

OF AN INTERNATIONAL SYMPOSIUM

MARCH 13-16, 1991

BEIJING, CHINA
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Esta serie incluye ponencias de reuniones, informes internos y documentos técnicos que pueden posteriormente conformar la base de una publicación formal. El informe recibe distribución limitada entre una audiencia altamente especializada.
New Horizons in Agricultural Information Management

Proceedings of an International Symposium,
March 13-16, 1991, Beijing, China

Compiled and Edited by
Gary K. McConen
Organiizing Committee

Main Organizing Committee

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Digitized Image Transmission Using High Speed Telecommunications Networks

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BACKGROUND

The National Agricultural Library (NAL) and 44 major universities in the United States have been working for the past two years on a cooperative project to test a new method of capturing full-text and images in digital form for publication on CD-ROM (Compact Disc-Read Only Memory).

Phase one involved testing the scanning/optical character recognition (OCR) workstation and evaluating several commercial software retrieval packages, as well as eliciting reactions from both university librarians and end users.

The first CD-ROM contains 4,000 pages of aquaculture material, and uses Textware software. The second disc contains documents published by the Consultative Group for International Agricultural Research (CGIAR), using KAware2 software. NAL's extensive collection on the herbicide Agent Orange provided the documents included on the third disc, which uses Personal Librarian software for access.

Each CD-ROM includes both bit-mapped page images and corresponding ASCII files which allow for full-text retrieval.

Phase two is being accomplished under a grant from the U.S. Department of Education at the University of Vermont where approximately 1,000 Canadian government documents pertaining to Acid Rain are being scanned, digitized, and cataloged. The resulting 11,000 pages will be published on three CD-ROMs and distributed to the participating land grant libraries in March 1990.

IMAGE TRANSMISSION OVERVIEW

Phase three, the transmission of digitized page images to remote sites is being conducted by NAL and the North Carolina State University (NCSU) Libraries will evaluate the following elements:

1. The use of standard, widely-supported image formats for scanned page images

2. The use of widely available computers for display and manipulation of the page images
3. The efficiency, speed, and ease-of-use of the national Internet and local area networks for distributing page images

4. The administrative arrangements and structures required for soliciting requests and satisfying them through electronic distribution.

**Image Format**

The project will be using Tagged Image File Format (TIFF) as the data exchange standard for digitized page images. The scanning workstation at NAL currently creates image files in a special high resolution LaserView format which must then be converted to TIFF by software algorithms.

**End User Computers**

In order to display the LaserView page images, users in the first two phases of the project must have a special high-resolution monitor. This third phase will investigate techniques that will enable a user to obtain the best possible image on whatever retrieval station is being used. Most of the nodes used initially at NCSU will be Macintosh IIs.

**Internet and Local Area Networks (LANs)**

The U.S. National Science Foundation’s Internet currently connects more than 40 of the universities which closely cooperate with NAL, although not all of their libraries are connected, yet. NCSU will utilize the Ethernet capabilities in its computer center and the AppleTalk-based LAN in the D.H. Hill Library to retrieve image files from Internet and redistribute them to users.

**Administrative Procedures**

Project staff at NCSU and NAL will develop and evaluate several mechanisms for processing document requests, both for this limited study and also should image transmission be adopted for inter-library lending (ILL) production in the future.

**IMAGE DELIVERY TO END USER**

After the page images are received and acknowledged by NCSU Library staff, they must be distributed to the requestor. Three distribution methods will be evaluated.

1. **Direct electronic delivery**: The requestor will pick up an electronic copy of the images directly from the NCSU VAX computer, once notified by Library staff of the file location.

2. **Intermediate electronic delivery**: Requestor will review images on one of the NCSU Library nodes. If electronic format is required, Library staff will provide copy of images on diskette.

3. **Print copy delivery**: NCSU Library staff will review images and print copy at 300 dpi for delivery to requestor.
Figure 1. Equipment Installed at NAL
OPERATING ENVIRONMENT

NAL has installed several pieces of equipment to enable us to access SURAnet, one of the thirteen regional Internet Protocol networks. (Figure 1) Because NCSU is already connected to SURAnet, and has an operating AppleTalk local area network, they only needed to connect the D.H. Hill Library with the Computing Center.

For this pilot project, NCSU Library staff will utilize several mechanisms for locating and processing document requests that can be satisfied by the project technology. (Figure 2)

Sources of Citations
To insure that requested documents are located at NAL, three sources will be preferred:

1. Aquaculture CD-ROM
   [NAL will have digitized images already]
2. AGRICOLA online or CD-ROM
   [or Bibliography of Agriculture]
3. OCLC records with NAL as a location

Sources for Requests
Most requests will originate at the D.H. Hill Library, or be channeled through there at least initially. The agricultural research area, the Veterinary Medicine Library, and other locations may also generate requests.

Because of copyright concerns, only documents produced by the federal government or other copyright-free publications will be requested/delivered. While there are certainly enough such publications to satisfy this pilot project, the copyright issue has to be addressed before any large-scale implementation of an image transmission system could be considered.

Delivery of Requests
Requests will be sent to NAL by Email via Internet, Bitnet, ALAnet, etc. The project will also investigate using the OCLC ILL system and telefacsimile to request documents.

Filling of Requests at NAL
NAL Lending staff will divide the requests into "Special Handling" and "Normal Workflow," to assess impact on Lending and contractor workflow. Special Handling requests will be sent by FAX and received throughout the day. Normal Workflow requests will be sent by Email and received by NAL once each day.
Figure 2. Network Schematic.
EVALUATION

The evaluation will address four broad areas: ease of use and accessibility to the end user, demand, cost-effectiveness, and copyright issues. If the system proves to be "user-friendly," and/or the demand is sufficient, and/or this means of document delivery is cost-competitive, and/or copyright issues can be resolved, then further progress along the lines of this project would clearly be warranted.

FUTURE DIRECTIONS

As NAL continues to create full-text CD-ROMs and explores image transmission, the number of documents available in digitized format will continue to increase. Because AGRICOLA is the primary access tool for NAL collections, we will need to develop a method of recording the existence of a digitized version in the bibliographic record for a document. Ultimately, the image files could be stored on a device accessible through Internet so requesting libraries could simply download the images directly and not go through NAL's Lending Branch.

University libraries may want to take an active role in building the database and begin scanning documents at their own locations. Libraries could be assigned to digitize a certain set of publications, or could scan them as they fill ILL or in-house photocopy requests. The resulting image files could be centrally located, or more likely, distributed at locations around the Internet but with a central index to them.