

USE OF EMERGING TECHNOLOGIES FOR INFORMATION MANAGEMENT AT THE NATIONAL AGRICULTURAL LIBRARY

James Krebs-Smith

I appreciate the invitation to talk with you today about some of the things we're doing with "newer technologies" at the National Agricultural Library.

Briefly, for those of you who may not be familiar with NAL, it is, along with the Library of Congress and the National Library of Medicine, one of this country's three national libraries.

NAL'S primary mission is to collect, store, and disseminate agricultural information to interested individuals worldwide. And, as you might guess, various technologies play a substantial role in helping NAL to accomplish this most challenging missions.

In my position within NAL as coordinator of the Food and Nutrition Information Center, I see myself primarily in the role of an "end-user" of information management technologies. And it's in my capacity as an end user that I will be speaking to you today.

Since I am a relatively new user of the technologies I'm about to describe, I'll be presenting primarily an overview of a few exciting projects going on now at NAL, and ten giving "demonstration" (via slides) of two technologies we use which are now becoming widely available.

To put things into perspective, libraries have been successfully automating bibliographic files for about the past 25 years. Some examples of this, with which most of you are probably familiar, include NAL's own AGRICOLA database and NLM's MEDLINE.

One of the first "newer technology" projects at NAL was begun in 1984 with the exploration of laser videodisc technology for the storage and retrieval of a full-text publication with graphics. The particular publication used for this project was something called the Pork Industry Handbook.

There were several reasons why the laser videodisc had attracted the Library's interest. The most significant of these, however, was that because every word, phrase and illustration of a publication becomes almost instantly accessible, there appeared the potential for this technology to radically alter the means by which publications are distributed and used.

Additionally, this was an opportunity to learn about transferring volumes of information onto an extremely durable and high-density medium. These 12 inch discs are truly remarkable: about 800 megabytes of data can be stored, about 1000 books 250 pages in length. Essentially then this project offered us an initial exploration of microcomputer access to agricultural materials which included both full text and graphics.

A second phase of this project is more closely studying the process of converting 13 widely used USDA and State Extension Service publications for electronic retrieval.

The National Agricultural Text Digitizing Project takes the process of full text access a step further. It explores both scanning technologies and full text information delivery, with most of the operations conducted in house. We will be utilizing CD-ROMS as the storage media for agricultural documents that are of high interest to NAL's user community.

This is a very exciting project for us, because it offers potential for in house processing of documents for mass storage on a fairly standard and stable medium.

To test the feasibility, cost and effectiveness of newly emerging technologies for capturing, indexing and disseminating textual information:

An initial pilot study will be evaluating various software retrieval packages. Coverage will include Food Irradiation; International Agricultural, Agent Orange and Aquaculture. Each will be mounted onto a CD-ROM and will utilize a different software retrieval package.

USE OF EMERGING TECHNOLOGIES FOR INFORMATION MANAGEMENT

librarian.

AGRICOLA DEMONSTRATION ON CD-ROM

Use of AGRICOLA on CD-ROM is advantageous where there is frequent use of database, or in remote areas where telecommunications hookups are impractical. It eliminates computer time usage charges. User had unlimited access for fixed fee. Also, software makes it much easier than online searching.

Compact Disk Read Only Memory - 4.75 inch diameter

Laser technology - three mile long spiral track; data stored as series of microscopic "pits and flats" spiraling from center out; info read by laser beam focused on disc surface; drive detects the reflected optical signal as digital info.

Durability - Virtually no wear because nothing touches disc; no danger of head "crashes". Non Magnetic, so not susceptible to accidental erasure. Highly resistant to minor scratches and fingerprints. Plastic disc, with information surface covered by transparent layer of plastic. Next, a reflective coating is applied behind the information surface, and a label and protective lacquer are added to complete the process.

Capacity - 75 mins. music
1500 dd floppies
550 million bytes of user data
275,000 pages of text (single spaced)

Equipment - CD-ROM drive (approx \$750)
search software (comes w/subscription to disc)
PC (AT or 386 preferable) w/hard drive

SilverPlatter produces from AGRICOLA sales tapes (NTIS); OCLC has just done same + CRIS.

Was \$1700/yr. Now around \$1000 (includes software); Issue quarterly updates (exchange old for new).

DEMONSTRATION

<<SLIDE--Opening screen>>

Describe opening/"title" screen layout:

Top center-- database and coverage yrs. Screen 1 of X

Summary description of dbase

FIND: -- begin search here; can return to opening screen via F7 at any point.

<<SLIDE--Help 1/19>>

Explain/show context-sensitive Help screens via F1. Since FIND specified on command line, relevant HELP provided to aid user w/SilverPlat search techniques) Very thorough.

<<SLIDE--Help: INTRODUCTION>>

Would be where someone new to the system should begin--good overview of system.

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<<SLIDE--FIND: Lower left corner>>
Note misspelling.

<<SLIDE--# hits>>
FIND (F2): NUTRITION (point out # of hits= # found in Index (F5).

<<SLIDE--and Education>>

<<SLIDE--# hits>>
AND EDUCATION Draw attn back to command line. (# reflects hits with both terms found in record; might say something about Boolean operators here)
AND CHILDREN IN TI HELP on Labels for different fields readily available.

<<SLIDE--47% complete>> Notice bottom line reflecting status of search--appears only if takes longer than 5 seconds to complete. Can interrupt if too long.

<<SLIDE--# hits>> Progressive narrowing in number of citations retrieved.

<<SLIDE--AV's in PT>>

<<SLIDE--# hits>> One final step to limit to AV's only.

<<SLIDE--after hitting F4>>
SHOW (F4): Explain default is ALL --slide showing full record didn't turn out; show how to change default CITN,AB. Point out different fields of bibliographic record. Note how selected terms are highlighted (shows better in next slide). Note bottom lines--can select any term in record to search on...

<<SLIDE--terms highlighted>>
I've adjusted the contrast here to better show how selected terms are highlighted.

<<SLIDE--TI,PY>>
To scan citations more quickly, might wish to preview only titles and year of publication, as show here. Of course, you have the option of printing citations in same forms as you view them on the screen.

<<SLIDE--BLANK>>
The final application of an existing ("off-the-shelf) technology that I'd like to show you is that of Expert systems. The slides I have are of the first System created at NAL--on aquaculture. However, after a brief intro to what an Expert System is, I'll demonstrate one that's hot off the press that deals with Food and Nutrition.

<<SLIDE--Aquaref>> WHAT IS AN EXPERT SYSTEM?

<<SLIDE--Mimics>>
In general, such systems...mimics the advisory work done by human experts, in this case, reference librarians with expertise in aquaculture.

WHY HAS NAL BECOME INTERESTED IN THEM?

With both Reference and Information Center staff limited, we needed a quick and easy

USE OF EMERGING TECHNOLOGIES FOR INFORMATION MANAGEMENT

alternative for handling ready-reference requests.

<<SLIDE--Supports reference>>

Main objective to support Reference activities. We receive large volume of info requests each day in certain subject areas--especially nutrition. Such a system helps to extend ref. staff -- answers routine questions; helps develop onsite user independence, and frees staff to focus on more complex requests. It serves as a viable means of providing onsite user's with access to library resources when the reference librarian is not available.

An expert/advisory system can also capture the collective knowledge of subject specialists for the benefit of its users to help guarantee reliable and high quality information service.

<<[SLIDE] (Kinds of Reference Support)>>

AquaRef was designed to provide the following kinds of Reference Support:

Bibliographic-- where users are guided to appropriate bibliographic references such as a book, article, or audiovisual.

Directional-- where users are provided with contact sources in the field for additional information.

and Educational-- the system provides some basic information; for instance, the calcium content of some common foods.

<<[SLIDE] (Software Selection Criteria)>>

The Criteria for software selection included it: --running on a PC or compatible --utilization of an "expert system shell"; Shells are expert system tools that facilitate the creation of expert or advisory systems (where you do not have to know a programming language such as Lisp or Prolog). --and that the completed product be easy for users to use!

Also it was important that the software be: --inexpensive (less than \$1500)

--easy to update

--and be able to link externally to databases and other computer systems.

(Our objective was to make AquaRef available for patrons and librarians to use in the Reference area)

<<[SLIDE] (Creation)>>

The creation phase normally involves a "domain expert" (knowledge provider) and a "knowledge engineer" (knowledge gatherer, assimilator, and developer of expert system structure); in our case, the reference librarian and subject specialist served both roles!

<<[SLIDE] (1stCLASS)>>

1stCLASS Software (by Programs in Motion, Inc.) met all of our requirements;

It runs on an IBM PC, XT, or AT and Compatibles; costs \$495.00 which includes a Run-Time (Advisor) program allowing distribution copies to be made.

It offered a special chaining feature, enabling literally thousands of modular knowledge bases (files) to be linked together.

It also offered advanced capabilities, such as execution of external programs.

<<SLIDE--Coverage>> Areas where development of systems is progressing. Will demo nutrition.

EXAMPLE OF APPLICATION -- DEMO

<<SLIDE--Intro screen>>

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Explain intro screen Explains basic purpose of "FNICAID"

<<SLIDE--Topic of Interest??>>

Highlight FNIC Explain that categories reflect areas of greatest interest. First, overview of Center; then breakdown of various products and services.

<<SLIDE--Basic FNIC mission stmt.>>

<<SLIDE-->>

Highlight Eligibility for Services Explain this is common question. Listed are basic FNIC services (lending, reference), and "information products".

<<SLIDE--"Everyone may borrow...>>

This is a statement of our lending policy. Those who are eligible for our direct services are also referred to another section of the program for details about reference assistance. Point out options on bottom line

<<SLIDE--GO BACK ONE SLIDE!>>

Can't resist opportunity to plug on service of our center that might be of direct interest to you--Software Demo Center.

<<SLIDE--ADVANCE 2 SLIDES>>

<<SLIDE--PC with Software>>

(FNIC) has put together a software demonstration and review center currently housing over 140 programs for dietary analysis, food service, and nutrition education. Many of these programs were purchased from private vendors, but many more have been donated for use at the center. Though not available for loan, software can be reviewed onsite. FNIC's computer hardware includes an IBMPC, an Apple II+, IIc., and Macintosh. End of Commercial--back to demo....

<<SLIDE--Nutrient Comp Tables>>

This being the Nutrient Data Bank Conference, I feel obliged to highlight this option.

<<3 SLIDES (Slowly)--answer>>

Even though this information probably isn't new to you, it's the kind of thing we get dozens of questions on each month.

<<SLIDE--Agricola>>

Finally, it is through this option that one can gain direct access to NAL's database. This is one of the "Chaining" features I mentioned earlier. Program could also be designed to access a laser videodisc, or any other type of connected equipment.

<<SLIDE--agricola access explained>>

So an individual would be able to search database on any area of interest, then automatically return to FNICAID when done.

<<SLIDE--Which method...?>>

Those skilled in online searching can gain access through Dialog, while others are directed to CDROM, which can be linked directly to PC.

<<SLIDE--blank>>

USE OF EMERGING TECHNOLOGIES FOR INFORMATION MANAGEMENT

The majority of the information in FNICAID is targeted for consumers.

IN SUMMARY, FNICAID represents a small-scale advisory system for the support of Reference activities at FNIC. We hope it has set the tone for future developments in other subject areas. If similar systems were in operation, they could assist the reference librarian in handling ready-reference inquiries. As a result, the reference librarian could be more efficient in dealing with complex inquiries that we are best suited for.

And perhaps you could envision some other applications for such a system.....

Let me close, then, with an invitation for you to visit us at NAL if you're interested in learning more about any of these technologies. There are some handouts on a few of the areas on which I spoke, and include who to call at NAL to arrange a visit.

Thank You