CHAPTER 4 *Notable Events*

Conferences

CIKM-92, First International Conference on Information and Knowledge Management

November 8-11, 1992, Baltimore, MD. Sponsored by ISMM and the University of Maryland Baltimore County in cooperation with AAAI, IEEE, ACM (SIGART and SIGIR), Bellcore, UMBC.

For more information, send mail to cikm@cs.umbc.edu

Computer Professionals for Social Responsibility Annual Meeting

October 16 - 17, 1993
University of Washington, South Campus Center
Seattle, Washington, USA

Envisioning the Future:

A National Forum on the National Information Infrastructure and Community Access

Co-sponsored by the American Society for Information Science Pacific Northwest Chapter (ASIS-PNC)

The National Information Infrastructure (NII) is the proposed medium or "electronic highway" that will connect schools, libraries, government agencies, and citizens using state-of-the-art computer and communications technology. Media, computer, and telecommunications companies are also acutely interested in the NII as it dramatically increases their opportunity for delivery of communication, services, and entertainment. CPSR is convening this meeting for both computer professionals and the informed public to discuss the broad range of choices facing society regarding the NII.

Saturday, October 16th

- 8:00 - 9:00 Registration/Coffee & Tea
- 9:00 - 9:15 Welcome to the CPSR Annual Meeting - Aki Namioka
- 9:15 - 10:15 Keynote Address - Bruce McConnell, Office of Management and Budget

"Shaping National Information Infrastructure Policy"

Bruce McConnell, Chief of Information Policy at the Office of Information and Regulatory Affairs in the Office of Management and Budget (OMB), will present his views on the major NII issues now facing the administration. He has been with OMB since 1985 and became head of Information Policy in 1992. He now chairs the inter-agency task force responsible for developing federal information policy for the Information Infrastructure Task Force.

- 10:15 - 10:45 Break

- 10:45 - 12:15 Panel Discussion - Moderated by Eric Roberts

"Public Access to Internetworks"

Public access to the Internet (and other major networks) is a critical issue in any discussion about an "electronic highway". Panelists representing a wide variety of perspectives, including representatives from the Pacific Northwest, will present their views.

Panelists:
Phil Bereano, College of Engineering, University of Washington
Eric Hood, NorthWestNet
Kenneth Kay, Computer Science Policy Project
Jim Taylor, Coordinator Automated Services, Seattle Public Library

- 12:15 - 1:45 Lunch Break
- 1:45 - 3:00 Panel Discussion - Moderated by Andrew Gordon

"Municipal Information Infrastructure"

City and other government agencies are exploring possibilities for developing municipal networks. In this panel a city official as well as a representative from the state regulatory agency and a representative of commercial interests will offer their insights and interests.

Panelists:
Joe Hommel - Washington Utilities and Transportation Commission A representative from the Department of Administrative Services for the City of Seattle

- 3:00 - 4:30 Panel Discussion - Moderated by Doug Schuler

"Networking in the Community"

Community networks exist and are being developed all over the U.S. Panelists from various community networks will present their perspectives on the state of community networking now and in the future.

Panelists:
Tom Grundner, National Public Telecomputing Network

Parker Lindner, New Media Matters
Evelyn Pine, CPSR/Berkeley member and former Executive Director of the Community Memory Project
Roy Sahali, CLAMDYP (Computing Literacy and Access Making a Difference for Youth Projects)

- 4:30 - 4:45 Break
- 4:45 - 6:15 Panel Discussion - Moderated by Marc Rotenberg

"Computers and Democracy - What's the Connection?"

How might computers facilitate the democratic process? How might they pervert it? "Electronic Democracy" is currently in the public eye and aspects of it will probably be tested soon. What can be done to promote wise uses of computers in this critical area?

Panelists:
Jeff Chester, Center for Media Education
Jamie Love, Taxpayers Assets Project
Leah Lievrouw, Department of Telecommunication and Film,
University of Alabama

- 6:15 - 6:30 Closing Remarks - Jeff Johnson
- 7:00 - 7:30 No Host Bar at Banquet Site
- 7:30 CPSR Banquet - Fundraiser - Waterfront Activities Center (Vegetarian food will be available)

+ Presentation of the 1993 Norbert Wiener Award to The Institute for Global Communications (IGC)
Presenter: Eric Roberts

The CPSR Board of Directors has chosen to award the 1993 Wiener Award to IGC in recognition of the work the organization has done to use network technology to empower previously disenfranchised individuals and groups working for progressive change. Geoff Sears, IGC's Executive Director, will be present to accept the award.

+ Banquet Address and Interactive Event - Kit Galloway, Electronic Cafe International

Kit Galloway of Electronic Cafe International in Santa Monica, California will present his innovative approach to electronic communication using phone lines, slow-scan television, and other technology. Using videotapes and a live demonstration with CPSR chapters in Los Angeles and other locations, Kit will discus how the Electronic Cafe concept has been used in a variety of settings. Electronic Cafe International has staged global events with poets, children, and communities in France, Nicaragua, Japan, as well as a variety of American cities.

Be sure to attend the banquet and participate in this provocative encounter with multimedia community networks !!

Sunday, October 17th

The second day of the conference will feature a more interactive format including several workshops, a discussion of CPSR's NII vision, and a special - free and open to the public - panel discussion on "Privacy Implications of Health Care Reform" Sunday evening.

- 8:30 - 9:30 Coffee & Tea
- 9:30 - 11:30 Workshop Sessions

Gender Relations in Networking - Judi Clark
Information Policy: A Framework for Action - Karen Sy
Computer Professionals and Social Action - Jeff Johnson

- 11:30 - 1:00 Lunch Break
- 1:00 - 2:30 CPSR Discussion
- 2:30 - 3:00 Break
- 3:00 - 4:30 CPSR NII Vision Document Discussion - Moderated by Todd Newman
- 4:30 - 5:00 Closing Remarks - Future CPSR NII Program - Marc Rotenberg
- 7:30 - 9:30 Special Panel Discussion

"Health Care Reform and the National Information Infrastructure: Opportunities and Risks"

This special event is free and open to the public.
Kane 210, University of Washington

ABOUT CPSR

Computer Professionals for Social Responsibility stands alone as the only national, non-partisan, public-interest organization dedicated to understanding and directing the impact of computers on society. Decisions regarding the use of this technology have far-reaching consequences that necessarily reflect the basic values and priorities of the people who govern their use.

Founded in 1981, CPSR has 2000 members from all over the world and 22 chapters across the country. Each of our members is an important participant in the dialogue that is helping to shape the future use of computers in the United States. Our National Advisory Board includes one Nobel laureate and three winners of the Turing Award, the highest honor in computer science.

We believe that as the influence of computers continues to permeate every aspect of our society, it is important that professionals become active participants in formulating the policy that governs computer use and access. CPSR welcomes any and all who share our convictions.

Creating CD-ROMs for Science Education Conference

April 1-3, 1992, Colorado Springs. Organized by the Center for the Improvement of Physics Instruction, University of Nebraska, with funding from the National Science Foundation, Educational and Human Resources Directorate, Award MDR-9253138, Gerhard Salinger, Program Officer. Proceedings available from University of Nebraska.

This conference brought together about 45 people representing 8 projects developing databases for science education, K-12 and undergraduate, plus representatives or professional organizations and industry.

For further information, contact, Robert G. Fuller, Center for the Improvement of Physics Instruction, University of Nebraska, 1110 Ferguson Hall, Lincoln, NE 68588-0109. Phone 402/472-2790 or 800/332-0265 (ask for Toolkit); fax 402/472-6234. For subscription to mail server, contact Norman Chonacky: nchonacky@-james.bowdoin.edu

Document Delivery & Internet Conferences

Conferences & Exibits focusing on the issues, utilization and implications that these services will have in the library environment.

Wyndham Franklin Plaza, Philadelphia, Pennsylvania December 7-8, 1992

Sponsored by: Meckler - Managing Information Technology

Meckler, a leading provider of information technology publications and conferences for librarians is pleased to present two conferences of significant technology-based services that will be greatly affecting libraries and patrons in the coming years.

Document Delivery: While commercial document delivery services are not new, what has changed is the high level of integration of computers, telecommunications, networks and fax machines for the identification and delivery of information. This conference will discuss: - Trends and Issues - Relative Costs of Interlibrary Loan Delivery System - Access vs. Ownership - Case Studies of Commercial Services - Case Studies of Library Cooperatives - Copyright Issues - Transboarder Issues and Programs - Subject Specialty Issues - OCLC's and RLG'S Document Delivery

Internet: The Internet is currently used by nearly 3 million people. Internet is a collective term for the many backbone, regional, and site data networks that it comprises - more than 5000 networks in 33 countries. From on-line catalog access to news services, remote control of CD players, and browsing through archives, the Internet has become part of everyday library operations. This conference will discuss: - Virtual Library Projects - Connectivity Options - Emerging Interlink Standards - Bibliographic Management of Internet - Gateways to European Databases - US Gateways - GPO WINDO: Gateway to Government - Special, K-12 and Public Library Connectivity

The Electronic Library: Administrative Issues for Organization & Access Institute

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I.A.3.
Fr: Arnold Hirshon
<AHIRSHON@WSU.BITNET>

Re: ALCTS Institute on the Electronic Library: Administrative Issues

THE ELECTRONIC LIBRARY: ADMINISTRATIVE ISSUES FOR ORGANIZATION & ACCESS INSTITUTE Sponsored by The Association for Library Collections & Technical Services, A Division of the American Library Association Hyatt Regency Cincinnati, OH Oct. 16-17, 1993 (Program will occur immediately prior to the EDUCOM meeting)

FOR COMPLETE INFORMATION CONTACT: ALCTS/ALA, 50 E. Huron St., Chicago, IL 60611. 800-545-2433, extension 5032.

OBJECTIVES: In what promises to be a watershed event in defining the future of electronic scholarly information systems, ALCTS is sponsoring this program to provide senior-level decision makers with information which they need to articulate a vision and formulate strategies for their institutions as they move from trends and concepts (like Gophers and WAIS) to the concrete reality of electronic libraries. Administrators need information about * design principles * governance issues * staffing and service concerns * potential outcome of electronic libraries. Geared specifically to the needs of senior level decision makers (such as directors and associate directors) of libraries and computing facilities, this institute will focus on administrative concerns and will be generally non-technical in nature. Participants will receive information necessary to * articulate the vision * formulate the strategies for the local institutional planning process.

METHODS: Presentation of papers and case studies with live demonstrations will be among the educational techniques used. In addition, breaks will provide an opportunity to speak with vendors who are in the forefront.

AUDIENCE: The institute, to be held immediately prior to the 1993 EDUCOM meeting in Cincinnati, has been designed for upper-level administrators (deans, directors, associate directors) from libraries and computer centers in academic and other institutions who are interested in providing electronic information to their users.

FEES: Fees for the institute are $225 for ALCTS members; $265 for ALA members; $305 for non-ALA members. Registration fees include instructional materials, refreshment breaks, and continental breakfast and full lunch on Sunday.

FACULTY: - - Arnold Hirshon, University Librarian, Wright State Univ. - - Jill Ellsworth, Assistant Professor, Southwest Texas State Univ. - - Michael Buckland, Professor, Univ. of California at Berkeley SLIS - - Brian L. Hawkins, Vice President for Academic Planning & Administration, Brown University - - Jeffrey Trzeciak, Head, Automation Services, Wright State Univ. - - Beth Shapiro, University Librarian, Rice Univ. - - Kevin Long, Director of Educational and Research Computing, Rice Univ. - - Peter Graham, Associate University Librarian for Technical and Networked Information Services, Rutgers Univ. - - Malcolm Getz, Associate Provost for Information Services and Technology, Vanderbilt Univ. - - David Penniman, President, Council on Library Resources - - Others to be announced

PROGRAM OUTLINE

SATURDAY, OCT. 16

- 12:00-1:00 p.m. Registration
- 1:00-1:30 p.m. Welcome and Overview of the Institute: From Virtual Libraries to Working Reality: The Challenge to “Just Do It!” Arnold Hirshon, Wright State Univ.
- 1:30-2:30 p.m. Keynote Address: The Electronic Library: If You Build It, Will They Come? Jill Ellsworth, Southwest Texas State Univ.
- 2:30-3:15 p.m. Vendor Demonstrations and Break
- 3:15-4:45 p.m. Electronic Information: What Is It and How Do We Organize It?: Putting It Together: The Principles of Information Access - Michael Buckland, Univ. of California at Berkeley SLIS Case Study #1: Example of an Early Implementation of an Electronic Library System - Jeffrey Trzeciak, Wright State Univ.; Case Study # 2: Example of an Advanced Implementation Presenter to be Announced
- 5:00-6:00 p.m. Reception and Cash Bar
-

SUNDAY, OCT. 17

- 8:00-9:00 a.m. Continental Breakfast
- 9:00-10:30 a.m. Internal Organizational Issues: Re-engineering the Organization for the Virtual Library: Staffing and Service Issues - Beth Shapiro and Kevin Long, Rice Univ. Moving Beyond Traditional Electronic Services: Collection, Access and Text Management Issues - Peter Graham, Rutgers Univ.
- 10:30-11:15 p.m. Demonstrations and Break
- 11:15 a.m-12:15 p.m. The Economics of Information: The Price of Doing Business in the Virtual Environment - Malcolm Getz, Vanderbilt Univ.

- 12:15-2:00 p.m. Lunch
- 2:00-3:15 p.m. External Organizational Issues: The Role of the Library in the Development of the Electronic Library and The Role of Campus Computing Services in the Development of the Electronic Library - Brian L. Hawkins, Vice President for Academic Planning & Administration, Brown University - Additional Speaker to be Announced
- 3:15-4:00 p.m. Approaching the Future: National Trends and Local Challenge: The New Electronic World Order: Implications for Local Development - David Penniman, Council on Library Resources

GopherCon '93: Internet Gopher Workshop and Internet Gopher Conference

April 12-13, 1993
Minneapolis, Minnesota

Prentiss Riddle
riddle@rice.edu

GopherCon '93 consisted of two events: an invitation-only workshop for about 75 participants focusing on technical details mostly related to the Gopher+ development effort, and a larger conference of some 250 participants covering a broader range of topics including CWIS and library applications of Internet Gopher. Both events were jointly sponsored by the University of Minnesota and by CICnet.

Day 1: the Workshop

GOPHER HISTORY: After greetings from our hosts, things got rolling with reports on the past, present and future of Gopher from the UMinn GopherTeam. Farhad Anklesaria began by recounting the history of Gopher development: UMinn's first attempt to design a CWIS resulted in a classic design-by-committee monstrosity, to which the Gopher Team responded by proposing a very simple protocol which they believed they could actually implement. The proposal was not well received by the

CWIS committee, but after an attempt to out-source computing services at UMinn failed, its opponents retreated and the Gopher Team was permitted to proceed. (This was enlightening not only as an example of the effect of political history on technology, but also because it may explain something about the Gopher Team's mistrust of design by committee, about which more later.) The talk also illustrated how much ground Gopher has covered: from in-house demo to a very popular technology and an RFC (#1436) on the IETF standards track in just two short years.

GOPHER PRESENT AND FUTURE: Mark McCahill gave an overview of the features being developed in Gopher+, the upwardly-compatible extension to the protocol (also known as "a gopher with a bag on the side to hold more"):

-- Item attributes: meta-information about Gopher objects.

-- Multiple views of objects.

-- ASK blocks: a method of passing information from the user to the server. While originally conceived as a forms fillout mechanism, ASK blocks are now expected to provide much more, including a way to make structured queries against a database.

-- "AdmitOne", a home-brewed authentication mechanism based on single-use tickets.

McCahill also mentioned some future directions for Gopher development:

-- Support for URNs and URLs ("Unified Resource Names" and "Unified Resource Locators"), a pair of standards in the IETF process for identifying Internet resources.

-- A Gopher->Z39.50 gateway.

-- The idea of combining ASK blocks with an authentication mechanism to create read-write Gopherspace. (While I find the prospect intriguing, I wonder about the wisdom of jerry-rigging it this way rather than designing the necessary protocol extensions to support it explicitly.)

-- Support for Whois++ (an IETF effort intended as a simpler alternative to X.500).

The other members of the Gopher development team reported on their work:

-- Paul Lindner, author of the Unix server and curses client, continues to enhance the base Gopher versions while working on Gopher+. The latest version of the base

Gopher client now offers a download menu for dialup users; a better CSO interface; faster I/O; and snazzy dialogue boxes. The base Gopher server now uses a config file to eliminate compile-time defaults; user-configurable filename extensions; better numbering support ("Numb=" is fixed); and improved IP-based security. The Gopher+ server and client are coming along: they already implement forms via ASK blocks (the resulting information is processed by being handed off to perl scripts); alternate views and languages; extended information about items; and AdmitOne authentication. Upcoming enhancements for the Gopher+ client include specification of preferred data types and languages to take advantages of alternate views and a pretty, integrated pager, while Paul's plans for the Gopher+ server include automated mirroring of data and the integration of a relational database.

-- Bob Alberti reported on fixes to the Gopher-FTP gateway.

-- Dan Torrey spoke of his work on the PC client: he had programmed himself into a corner with the previous version, so he threw it out and started over. The result is PC Gopher III, which is multi-threaded to allow for menu accessibility even in the middle of a retrieve and appears much faster to the user. Future plans include a new memory management scheme to allow for Gopher+ and files over 360K; support for other TCP/IP stacks; internal support for 3270 sessions; and improved "helper" applications (image viewers, etc.).

-- Dave Johnson reported on his Mac client work. He has made various speed and user interface enhancements to the base Gopher client, and also has written a Gopher+ client which supports item attributes, alternate views, ASK blocks and AdmitOne authentication.

VERONICA: Fred Barrie and Steve Foster of the University of Nevada at Reno led a session on Veronica. Veronica is making great strides in the direction of reliability and responsiveness by dividing the work: at the time of the conference there were two Veronica servers up (at UNR and CNIDR), with three more expected soon. Recent improvements to Veronica software include faster server code, boolean support (AND and OR, but not NOT or parens), and better data harvesting and cleaning.

Some Veronica statistics: UNR has been receiving 150,000 queries per month; it takes 30 hours to prowl "known Gopherspace", meaning the 400+ servers in the UMN master list and their children (amounting to 1200 servers all told); Veronica detects over 10 million Gopher items, which it reduces after eliminating redundancies to about 1.5 million items; Veronica's database now takes up 350 Mb for raw data and 40 Mb for the index; up to 10% of the items in Gopherspace turn over in 1-2 weeks.

There is a lot to be gained by making Veronica use Gopher+ attributes, such as abstracts, keywords, or a controlled-vocabulary classification scheme. Not only will Gopher+ allow for better searching, but it should help with one of the most common user requests, namely additional context surrounding the items returned from a Veronica search.

Problems still to be solved: scaling (although this may not be a problem -- Barrie and Foster think that 12 servers should be sufficient through the end of the year); how to let people control their own data harvesting (ideas: a cache at the top of the Gopher tree, perhaps in a ".veronica" file, and/or coordination through regional networks); lack of permission to publish information gathered by Veronica ("we haven't been sued yet"); "Where am I?" questions for users; topic-oriented Veronica servers; meta-searches (like a "monster mindex").

GOPHER+ DIRECTIONS: This session began with a "lively exchange of views" between the Gopher development team and members of the Gopher community who felt that Gopher would benefit by paying more attention to standards which either already exist or are in parallel development. To overdramatize the split, one could call it an argument between "design by committee" and "design over a couple of weekends". Among the points of the critics: Gopher should try to be more expandable and more easily integrated with other protocols (we should avoid the need for gateways if possible); Gopher should support MIME types, which is distinct from supporting *a* MIME type; Gopher has confused the encoding type (e.g., compressed) with the content type (e.g., text), while MIME keeps these distinct. The standards which were most often discussed as being of potential benefit to Gopher were MIME, WWW, WAIS (and Z39.50), URLs and URNs.

Paul Lindner gave a short but provocative talk on a proposed "geographic" view type, "directory/GVIEW", which would present a menu as an image with "hot spots". His original idea was for "geographic" menus like maps of bus routes or Gopher sites, but it could also be used to create Gopher menus which would resemble VNS pages or WWW hypertext documents. (I am struck by the tendency of these technologies to start resembling one another.)

ACROBAT DEMO: Gary Cassamiti (?) of Adobe gave a talk on a very interesting forthcoming product called Acrobat which is intended to move Adobe from being a printer company to being a document language company. Evidently Adobe was surprised to see PostScript become a means of transmitting documents from place to place, ridden as it is with printer dependencies. Acrobat is Adobe's answer: a program which converts between PostScript and a PostScript-like document language called PDF ("Portable Document Format"). It is Adobe's bid to come up with a standard so ubiquitous that they are calling it "electronic paper". In addition to increased portability, PDF has several features desirable in a document exchange format: it retains the structure of the document, allows direct access to any page in the document, allows for embedded special fonts and replaces missing fonts on the fly, includes efficient compression techniques, and is extensible to include multimedia and programmatic objects in the future. PDF will be an open format and Adobe plans to help develop "save as" modules for common document preparation tools. Adobe plans to offer Windows and Mac viewers for PDF this summer and DOS and Unix viewers soon thereafter. If it catches on this would be a good candidate for a Gopher data type and could solve many document incompatibility problems.

ATTRIBUTE REGISTRY: This was dominated by another exchange between the Gopher development team and the proponents of compatibility with other standards. The main proposal was that rather than Gopher developing its own attribute registry, Gopher should use the IANA ("Internet Assigned Numbers Authority") registration process, which according to some only takes 3 to 4 weeks. There was also further discussion of MIME. Result: the UMinn GopherTeam agreed to look harder at MIME.

SOFTWARE LICENSING: The much-awaited confrontation between Shih-Pau Yen of UMinn and the Gopher community at large was heated, as expected. Mr. Yen presented a draft of a three-tiered licensing scheme: separate categories of licenses for educational institutions, small businesses and large businesses. Mr. Yen pointed out that all UMinn software released prior to GopherCon would be considered freeware and not restricted by the license, hence the license covered effectively only future Gopher+ development; furthermore, the licenses restricted only Gopher servers, not clients. Under the proposal, educational institutions would be exempt from licensing fees and in fact need not even sign the license. Rates for businesses would vary according to the size of the business and the use to which it put its servers (whether it charged for information served out); rates would go as high for large businesses as the greater of $5000 per server or 7.5% of fees charged for Gopher services.

Among the criticisms of Mr. Yen's proposal: By charging fees exclusively for servers, he would penalize organizations which wish to put information into Gopherspace to the benefit of us all; it might make more sense to charge for clients. The license agreements defined fees per year and made no guarantees that fees won't go up in subsequent years, raising fears of price hikes once the market was hooked on Gopher. The language of the license agreements defined the size of a business by the gross incomes of all entities owning a share of or partially owned by the business, which would mean that one wealthy investor owning 1% of an otherwise small business could kick it up into the large business bracket. Finally, there were the familiar complaints that the UMinn code wasn't written entirely by UMinn, that it has or will soon have freeware competitors, and that it doesn't come with the sort of support structure one might expect from commercial software. Mr. Yen seemed determined to proceed with licensing fees of some kind, and it was unclear to me how much he would modify his proposal in the light of the comments at GopherCon.

Day 2: the Conference

The second day began with a recap of the Gopher update from day 1.

REPORTS FROM MONDAY'S BREAKOUT SESSIONS:

Using Other Technologies -- MIME, Kerberos, Z39.50, etc (Jane Smith, CNIDR): Repeated the plea that the Gopher developers take a harder look at other standards and strive for interoperability.

Cataloging E-journals and Resources (Billy Barron, UTDallas): Spoke about the gains to be made from improved Veronica, including a controlled vocabulary for searching and use of Veronica data for research on the most common terms currently used in Gopherspace titles and Veronica searches. Experiments in the past few months suggest that Gopher classification efforts based on schemes like the Library of Congress or Dewey Decimal system are less successful than ad hoc "used bookstore" schemes.

Security, Authentication and Signatures (Tamara Iversen, Northwestern): Session focused on a hole in the design of the AdmitOne authentication scheme discovered by Lee Brintle of UIowa; suggested a modular authentication scheme selectable by each Gopher site.

Gopher Front-Ends to Databases (Paul Lindner): A number of efforts have taken place to integrate both relational and flat-file databases with Gopher. Two basic methods are common: a "shadow" system, in which reports are generated from the database and moved into Gopherspace, and on-line access to an interactive query engine. Paul plans to work toward integrated Gopher support of one flat-file db (DBase is the most popular) and one generic SQL db.

GOPHER+ ATTRIBUTE REGISTRY: The Gopher development team agreed to consider using the IANA registration process in the future. For now, new attribute types are to be registered by sending mail to the gopher-news list and reaching some sort of consensus in the ensuing discussion.

NEW GOPHER USES AND TOOLS: unless otherwise specified, any tools mentioned here are said to be available in the archives on boombox.micro.umn.edu.

Jughead (Rhett "Jonzy" Jones, UUtah): "Jonzy's Universal Gopher Hierarchy Excavation And Display", this is like a local veronica -- it allows for search by title of items in a local Gopher hierarchy. It supports boolean searches (AND, OR and NOT). A Gopher tree of some 45000 items takes about 30 minutes to walk and 10 minutes to index.

Procmail (Marie-Christine Mahe, Yale): a mail-to-whatever gateway which Marie-Christine has used as a way to put things into Gopherspace.

WELL Gopher (Paul Holbrook of CICnet): an interesting collection of original text resources from a well-known Internet watering hole. Highlights include works by Bruce Sterling and Stewart Brand. Gopher to nkosi.well.sf.ca.us port 70.

Ac (Eric Morgan, NCSU Libraries): an interactive tool for the systematic acquisition of electronic journals.

OS/2 Gopher client and server (David Singer, IBM Almaden Research Center): the client is already on boombox, the server is expected soon.

Gmail/gmailcal (Prentiss Riddle, Rice University): a mail-to-gopherspace gateway with an accompanying events calendar manager.

Grabdata (Mahesh Subramaniam, Notre Dame): a tool to gather data from users' AFS directories, perform various validation checks, and move it into Gopherspace.

Relational database of course schedules (Ed Moy, UCal): A gateway between Gopher and a relational database containing a course schedule. Works by selecting a set of courses and successively limiting it by such categories as day, department, starting time, ending time, room, instructor, etc.

MOOGopher (Erik Ostrom, Gustavus Adolphus College, and Larry Masinter, Xerox PARC): An object-oriented MUD (multi-user dungeon/dimension) with an integrated Gopher client. Objects in the MUD can contain Gopher items, and users can move about Gopherspace analogously to exploring a MUD. To see this in action, telnet to Jay’s House MOO at theory.cs.mankato.msus.edu port 1709.

[Editors’ Note: We were unable to connect to the MOO]

Overview of MSU tools and applications (Rich Wiggins and Dennis Boone): Lots of nifty things at MSU, including sound archives (historic voices and 1992 Presidential debates), tools to generate a Gopher “road map” and analyze Gopher logs, an “on-line photo gallery” of campus sites, and a “guest book” for recording user comments.

The coveted stuffed gopher was won by Erik Ostrom and Larry Masinter for MOOGopher.

SERVER ADMINISTRATION: The Server Administration breakout session was in some ways a continuation of the tool-off, but it got beyond tools to cover Gopher administration and design philosophy as well. Joel Cooper spoke more about how Notre Dame copies data from individuals’ AFS directories into Gopherspace. The procedure includes much error-checking and requires files to include a template containing information about author, expiration, etc.

Dennis Boone spoke about the design rules for the MSU CWIS, which may bear repeating here:

-- Ample “About” files.
-- No “hunt the wumpus” games -- hierarchy is preferable to a maze.
-- Lots of navigational tools (e.g., a title indexer)
-- The root directory should include help and be understandable
-- Directories should not exceed a screenful in length
-- Identity of data providers should be attached to all documents
-- Reliability: 24 by 7 support for Gopher services
-- Lowest common denominator: assume screens <= 72 columns wide and <= 16 rows high
-- No dead ends, no sparse directories
-- Local-use information is most important
-- Break these rules when necessary

Paul Linder spoke about the trials and tribulations of getting a CWIS off the ground at UMinn. Although he and the rest of the Gopher development team are celebrities in Gopherspace, he’s “just another joe” at his home institution. Some interesting tidbits: the principal servers at UMinn are a mirrored pair of Macintosh IIci’s running AUX; they carry out some 50000 transactions a day. UMinn is interested in ways to provide redundant servers, including the use of DNS route shuffling. The UMinn method of CWIS design emphasizes decentralization using small, cheap hardware, typically Mac servers. They see decentralization as a proper response both to the fact that "machines go down" and the need to put power in the hands of the people with the data.

I spoke about our experiences at Rice University with RiceInfo and some of the formal steps we've taken (the "RiceInfo Management Proposal", CWIS committees, Data Maintainer's Agreements, etc.). I also noted that, like MSU, we see reliability issues as encouraging reliably maintained central services over a potential chaos of less reliably maintained small servers.

ORGANIZING SUBJECT-MATTER BASED GOPHERS: A lively breakout session which made me wish I could have attended the other library- and resource-oriented sessions earlier in the conference.

Dan Jacobson of Johns Hopkins spoke about his biology Gopher server; he believes in the need for control to be in the hands of specialists in a field, not librarians. He also spoke of the need for context: guess what happens when a biologist does a veronica search on the word "mouse"? :-)

Mike McGervin of Stanford spoke of his work building a Gopher server of medical informatics sources based on ten years' experience with the SUMEX-AIM ftp archives.

Librarian Nancy John of the University of Illinois mentioned an Educom paper by Howard Strauss entitled "Anarchy in the CWIS". She spoke of the need to go beyond old methods developed for print resources (including the LC and Dewey classification schemes). One promising direction is the use of Veronica with Gopher+ attributes (Academic Discipline, Audience, Format (newspaper or novel), etc.) to provide needed context for searches.

(I piped up from the audience with a plea for feedback mechanisms from users and a community organized around each subject area, rather than depending on Gophermeisters discovering resources in isolation. I'd like to see a set of discipline-specific newsgroups or mailing lists devoted to the discovery of resources. I also talked a bit about "linkmerge", my ad-hoc scheme to merge subject-tree directories from other sites. Much to my surprise, people seem to like it, even the librarians who I expected to be horrified.)

CLOSING: The conference ended with a general question and answer session.

Highlights: Someone suggested a common conference at which Gopher, WAIS, WWW, etc. developers could meet (a good candidate to host such a conference would be someplace like CNIDR). Paul Lindner agreed to put ".cap" support back into the Unix Gopher server as an #ifdef option. The Gopher development team talked again about farming out documentation to outside volunteers.

My conclusions? There's lots happening in Gopherspace. It was very exciting to see all these talented people carrying out all of these great ideas. Gopher's explosive growth is continuing with no end in sight. At the same time, I was disappointed that Gopher+ has not matured more than it has -- there are still nagging details about the protocol, the feasibility of small clients, and the licensing of UMinn-developed software which could make Gopher+ less successful at fulfilling its goals than basic Gopher has been. I had hoped that these issues would be put behind us at the conference, but it is now clear that we will continue to struggle with them for some time.

- -- Prentiss Riddle ("aprendiz de todo, maestro de nada") riddle@rice.edu
- -- Unix Systems Programmer, Office of Networking and Computing Systems
- -- Rice University, POB 1892, Houston, TX 77251 / Mudd 208 / 713-285-5327
- -- Opinions expressed are not necessarily those of my employer.

InfoFair '92 - Mastering the Internet Maze

Thursday, April 2, 1992

University of Utah
Spencer S. Eccles Health Sciences Library
Salt Lake City, Utah

Sponsored by The University of Utah Health Sciences Center

INFOFAIR is an annual event at the University of Utah Health Sciences Center with the goal of providing up-to-date information on computer applications, resources and servcies as well as a glimpse into the future of computers and computing in the health sciences.

The theme of INFOFAIR '92 is: Mastering the Internet Maze. The morning presentations will focus on the Internet: what is the Internet, how to access the Internet, what resources and services are currently available. Sharing sessions and hands-on Internet sessions will be offered throughout the afternoon for new and experienced Internet users. Several workshops and demonstrations are also planned for the afternoon. These afternoon presentations offer a chance to learn more about new HyperCard features, Windows 3.0, Grateful Med and Loansome Doc. The exibits present a unique opportunity to try out new hardware and software, to become aquainted with computer services offered on and off campus, and to become familiar with computer applications developed at the University of Utah.

The Internet is a collection of computer networds linked through bridges, gateways and routers connecting univerities, government agencies and commercial companites. Examples of networks are NSFNET, WestNet, NYSERnet, etc. Today in the United States and around the world, there are over 500,000 computers connected to the Internet.

The Internet is an effective tool for academic and administrative users. Internet users can discuss common problems, write joint papers, keep up with current developments in their field, and access specialized databases, retrieve information from on-line archives, exchange files with colleagues, login to supercomputer centers and lookup information in on-line library catalogs.

The staff at the Eccles Health Sciences Library regularly connects to the Library of Congress, the New York Public Library and the University of California (to name a few prominent on-line catalogs). A dynamic environment, Internet access to special resources is a unique benefit to faculty, staff, students, residents and researchers here at the University.

From IAIMS Newsletter, April 1992, Vol 7, Num 7, University of Utah Health Sciences Center, published by the Spencer S. Eccles Heath Sciences Library

Information Exchange Telecommunications as Part of the National Information Infrastructure

You are cordially invited to attend the IEEE-USA Information Exchange on Telecommunications as Part of the National Information Infrastructure.

The United States needs to develop a world-class national information infrastructure. Fundamental to achieving this goal is establishing a national telecommunications policy that fosters effective application of evolving technologies, incentives for investment, and responsiveness to users. Many groups and associations are initiating projects to represent the views of their members on such an infrastructure.

Because IEEE's wide-ranging membership touches almost all entities addressing this issue, the IEEE Committee on Communications & Information Policy will convene an Information Exchange May 4-5, 1993, Rosslyn Westpark Hotel, Arlington, Virginia.

The purpose of this exchange is to allow the groups and associations developing a vision of U.S. information infrastructure to share views and better understand their respective issues. We envision a dialogue among those already active in this arena and other key individuals who are directly concerned with telecommunications. This will be a neutral ground where different interests can target particular issues important to them and this country. Panelists of national stature will cover the range from technology through policy. We expect many officials of the Executive and Legislative branches to participate as well.

The ultimate goal of this effort is to bring together the elements for a national policy to guide the nature and continuing development of a superior infrastructure. This Information Exchange is a first step in the process.

Attendance is limited. The conference fee of $150.00 and the completed registration form are due by April 15. A block of rooms has been reserved in the name of "IEEE" at a discounted rate of $87.00. Hotel reservations must be made directly with the hotel at [PHONE (703) 527-4814; FAX (703) 522-8864] or before April 3, 1993.

For registration and housing information, and a copy of the advance program, please contact:

Deborah Rudolph Manager, Technology Policy Council IEEE-USA 1828 L Street NW, Suite 1202 Washington, DC 20036 PHONE: (202) 785-0017 FAX: (202) 785-0835

Invitational Symposium on Knowledge Management

October 27-29, 1991, Coolfont Conference Center, Berkeley Springs, WV. Sponsored by the Council on Library Resources, Johns Hopkins University, and the University of California, San Francisco. Synopsis available from Johns Hopkins.

This conference brought together about 70 people from universities, funding agencies, and related organizations to discuss the changing infrastructure of scholarly communication in the age of electronics. The major discussion groups were Scholarly and Scientific Communication, Intellectual Property, Institutional Infrastructure, Education, and New Technologies for Knowledge Management.

For further information, contact Nina W. Matheson, William H. Welch Medical Library, School of Medicine, 1900 East Monument St, Baltimore, MD 21205. Phone 410/955-3411; fax 410/955-0985.

National Net ‘93

April 14-16, 1993

Loews L’enfant Plaza Hotel Washington, D.C.

Sponsoring Organizations: American Library Association, Association of Research Libraries, CAUSE, Coalition for Networked Information, Coalition for School Networking, Computing Research Association, Corporation for Research and Educational Networking, EDUCOM, Networking and Telecommunications Task Force, FARNET, Internet Society, National Association of State Universities and Land-Grant Colleges.

Corporate Sponsors: AT&T, IBM, Novell, Xerox

Topics: The NREN and the National Information Infrastructure - Competing Visions?; National Computing Environment & Grand Challenges; Citizen Access At The Statehouse; The ‘E’ in NREN; Internet Architecture for 100 Million Users; International Internet Report; Froma Network of Networks to a Community of Communities; K-12 Session; Images and Documents; Productive Partnering; Multimedia on the Internet; Reaching the Classroom; Sex on the Internet: Right or Wrong?; Listening of the Users; Internet Video: Meltdown or the Next E-Mail?; Easy Access Infrastructure and the 103rd Congress

New York Technology Summit - The Conference and Exhibition for Networking, Telecommunications, and Computing

Global Access Tools for Knowledge Workers

Jabob Javits Center, December 8-11, 1992 New York City, NY

The 1st Annual Conference and Exhibition on Telecommunications, Networking and Computing

As the world emerges from the age of information management and data communications and enters the next stage in the technology chain where the disciplines of communications, computing and telecommunications are wholly merged, an entirely new approach to management and problem solving will become necessary. These changes are revolutionary. Data communcations is being joined by high speed digital imaging; e-mail, voice and video mail are merging into a powerful mix that might be called multimail; video teleconferencing is making way for person-to-person desktop video computers and corporate morning meetings via LANS and WANS and mobile communications is evolving into wireless communications including facsimile, cellular phones, computer notepads and portables where total personal interactivity is becoming the standard.

The corporations which adapt to these technological innovations first will gain vital leadership positions in their fields and the resulting growth of these companies will quickly force all business to assess and evaluate their technology infrastructures or fear being lost in the world of the corporate have-nots. NYTS, the New York Technology Summit, will bring together the thousands of industry professionals - the executives, the information networking & telecommunication managers, technologists, developers, marketing directors and engineers from what used to be three distinct industries, Computer, Telecommunications & Networking, into one high technology gathering.

ACM SIGIR '93 16th International Conference on Research and Development in Information Retrieval

Pittsburgh, PA, USA
June 27-July 1, 1993

In co-operation with ACM:
AICA-GLIR (Italy) BCS-IRSG (UK)
DD (Denmark) GI (Germany)
INRIA (France)

PRELIMINARY PROGRAM AND REGISTRATION INFORMATION

The annual ACM SIGIR conference is the primary international meeting for the presentation of research and development in information retrieval (IR). The conference will be valuable to those interested in the theory of information retrieval as well as those responsible for system design, testing and evaluation. Topics include association methods, query processing, data and file structures, DBMS integration, structured text, inference networks, interface issues, and natural language processing.

This year the conference will be held in Pittsburgh, PA, USA, within easy reach of major east coast centers. The city centre conference site overlooks the three rivers, providing access to parks, restaurants and shopping, cultural amenities and sporting events.

Pre-conference tutorials will cover both beginning and advanced topics. The main program consists of contributed papers as well as panel sessions and demonstrations. There will be two post-conference research workshops, User Interfaces for On-line Public Access Catalogs, and Information Access and the Networks.

Conference highlights include:

Sunday * Tutorials
* Reception
Monday * Keynote address: Bruce Buchanan

* Text REtrieval Conference (TREC) overview
Tuesday * Panel session: NLP for Information Management
* Cruise and Banquet on Pittsburgh's Three Rivers
Wednesday * Demonstrations
* Reception
Thursday * Post-conference research workshops:
-User Interfaces for On-line Public Access Catalogs
-Information Access and the Networks
(see details at very end of this message)
* Tour of Frank Lloyd Wright's Fallingwater
* Tour and Open House at Carnegie Mellon University

Full conference registration includes technical sessions, proceedings, conference banquet, lunch at the SIGIR annual meeting, and two receptions.

Conference Organization:

Chair: Edie Rasmussen, University of Pittsburgh

Program Chairs: Robert Korfhage, University of Pittsburgh
Peter Willett, University of Sheffield

Tutorial Chairs: Donna Harman, National Institute of Standards and Technology
Joan Morrissey, University of Windsor

Program Committee: Ijsbrand Jan Aalbersberg - Philips Research Laboratories
Maristella Agosti - Universita' di Padova
Abraham Bookstein - University of Chicago
Christine Borgman - UCLA
Giorgio Brajnik - Universita' di Udine
Chris Buckley - Cornell University
Yves Chiaramella - LGI-IMAG
Kenneth Church - Bell Laboratories
Richard Fowler - University of Texas - Pan American
Ophir Frieder - George Mason University
Norbert Fuhr - Universitaet Dortmund
Michael Gordon - University of Michigan
Peter Ingwersen - Royal School of Librarianship, Copenhagen
Kalervo Jarvelin - University of Tampere
Marcia D. Kerchner - The MITRE Corporation
Kui Lam Kwok - Queens College, CUNY

D. Lucarella - CRA-ENEL
David Lewis - AT&T Bell Laboratories
Sung H. Myaeng - Syracuse University
Michael Nelson - University of Western Ontario
Kai A. Olsen - Molde College, Norway
A. Stephen Pollitt - University of Huddersfield
Lisa Rau - GE Research and Development Center
Stephen E. Robertson - The City University, London
Ernst Schuegraf - St. Francis Xavier University, Nova Scotia
Alan F. Smeaton - Dublin City University
Linda C. Smith - University of Illinois
Padmini Srinivasan - University of Iowa
Craig Stanfill - Thinking Machines Corporation
Keith van Rijsbergen - Glasgow University
Jean-Luc Vidick - Telinfo, Brussels

SIGIR ‘93 PROGRAM

Tutorials
Sunday, June 27, 1993

AM: Introduction to Information Retrieval
Keith van Rijsbergen, University of Glasgow
Developing Information Retrieval Applications using Object Database Technology
David J. Harper, University of Glasgow
Trends in Multimedia Development
Alan Griffiths, University of Sheffield

PM: Natural Language Processing for Information Retrieval
David Lewis and Elizabeth Liddy, AT&T Bell Labs. & Syracuse University
Information Retrieval and Databases
Norbert Fuhr, University of Dortmund, Germany
Non-Textual Compression in Full-Text IR Systems
Shmuel T. Klein, Bar-Ilan University, Israel

Technical Sessions

Monday, June 28, 1993

Session 1: Keynote Address, From Data to Information: Where is the Knowledge?
Bruce Buchanan, University of Pittsburgh

Session 2: Inference Networks
David Haines & W. Bruce Croft, Relevance Feedback and Inference Networks
P.D. Bruza & L.C. van der Gaag, Efficient Context-Sensitive Plausible Inference for Information Disclosure
Kostas Tzeras & Stephan Hartmann, Automatic Indexing Based on Bayesian Inference Networks

Session 3: Donna Harman, Overview of the First Text REtrieval Conference (TREC)

Session 4: Full Text Analysis
Gerard Salton, J. Allan, & Chris Buckley, Approaches to Passage Retrieval in Full Text Information Systems
Marti A. Hearst & Christian Plaunt, Subtopic Structuring for Full-Length Document Access
Chris D. Paice & Paul A. Jones, The Identification of Important Concepts in Highly Structured Technical Papers

Session 5: Compression & Signature Files
A. Bookstein, S.T. Klein, and Timo Raita, Is Huffman Coding Dead?
Gordon Linoff & Craig Stanfill, Compression of Indexes with Full Positional Information in Very Large Text Databases
Deniz Aktug & Fazli Can, Analysis of Multiterm Queries in a Dynamic Signature File Organization

Tuesday, June 29, 1993

Session 6: Association Methods
S.K.M. Wong & Y.J. Cai, Computation of Term Associations by a Neural Network
Rodrigo A. Botafogo, Cluster Analysis for Hypertext Systems
Douglass R. Cutting, David R. Karger, & Jan O. Pedersen, Constant Interaction-Time Scatter-Gather Browsing of Very Large Document Collections

Session 7: Query Expansion
Peter G. Anick & Rex A. Flynn, Integrating a Dynamic Lexicon with

a Dynamic Full-Text Retrieval System
Efthimis N. Efthimiadis, A user-centered evaluation of ranking algorithms for interactive query expansion.
Yonggang Qiu & Hans-Peter Frei, Concept Based Query Expansion

Session 8: Linguistic Analysis
Ellen M. Voorhees, Using WordNet to Disambiguate Word Senses for Text Retrieval
Julian Kupiec, MURAX: A Robust Linguistic Approach for Question Answering Using an On-Line Encyclopedia
Robert Krovetz, Viewing Morphology as an Inference Process

Session 9: Structured Text
Michael Fuller, Eric Mackie, Ron Sacks-David, & Ross Wilkinson, Coherent Answers for a Large Structured Document Collection
Pekka Kilpelinen & Heikki Mannila, Retrieval from hierarchical texts by partial patterns

Session 10: Panel on Natural Language Processing for Information Management
David Evans, Lessons from the CLARIT project
Jaime G. Carbonell, Lessons from TIPSTER/ SHOGUN/JANUS
Sergei Nirenburg, Lessons from PANGLOSS

Session 11: Processing for Japanese Text
Yasushi Ogawa, Ayako Bessho, & Masako Hirose, Simple Word Strings as Compound Keywords: An Indexing and Ranking Method for Japanese Texts
Hideo Fujii & W. Bruce Croft, A Comparison of Indexing Techniques for Japanese Text Retrieval

Wednesday, June 30, 1993

Session 12: Interface Issues
Edward A. Fox, Robert K. France, Eskinder Sahle, Amjad Daoud, & Ben E. Cline, Development of a Modern OPAC: From REVTOLC to MARIAN
Daniel E. Rose, Richard Mander, Tim Oren, Dulce B. Poncelen, Gitta Salomon, & Yin Yin Wong, Content Awareness in a File System Interface: Implementing the 'Pile' Metaphor for Organizing Information
Gert Schmeltz Pedersen, A Browser for Bibliographic Information

Retrieval, Based on an Application of Lattice Theory

Session 13: Mathematical Models
Yiming Yang & Christopher G. Chute, An Application of Least Squares Fit Mapping to Text Information Retrieval
Joon Ho Lee, Won Yong Kim, Myoung Ho Kim, & Yoon Joon Lee, On the Evaluation of Boolean Operators in the Extended Boolean Retrieval Framework
Carlo Meghini, Fabrizio Sebastiani, Umberto Straccia & Costantion Thanos, A Model of Information Retrieval based on a Terminological Logic

Session 14: DBMS/IR integration
Norbert Fuhr, A Probabilistic Relational Model for the Integration of IR and Databases
Peter Schuble, SPIDER: A Multiuser Information Retrieval System for Semistructured and Dynamic Data

Session 15: Query Processing and Evaluation
David Hull, Evaluation and Relevance Feedback
Nicholas J. Belkin, C. Cool, W. Bruce Croft, & James P. Callan, Effect of Multiple Query Representations on Information Retrieval System Performance
James P. Callan & W. Bruce Croft, Evaluation of Query Processing Strategies Using the TIPSTER Collection

Demonstrations (concurrent with sessions)
Coordinator: Philip J. Smith

Thursday, July 1, 1993

Post-conference research workshops:

User Interfaces for On-line Public Access Catalogs

Information Access and the Networks
(see more information on this at the very end of this entire message)

Tours:
Tour and Open House at Carnegie Mellon University
Frank Lloyd Wright's Fallingwater

FOR FURTHER PROGRAM AND REGISTRATION INFORMATION CONTACT:

SIGIR ‘93 Conference Secretariat
School of Library and Information Science
University of Pittsburgh
Pittsburgh, PA 15260, USA

tel: (412) 624-9459; fax: (412) 648-7001
email: sigir@lis.pitt.edu

PRE-CONFERENCE TUTORIALS
Sunday, June 27, 1993

SIGIR tutorials provide an opportunity to learn the basics of IR or to learn about a new or specialized area from experts in the field. This year, six half-day tutorials are available prior to the main program, held in parallel sessions during the morning and afternoon. Separate registration is required for tutorials.

Morning Tutorials: 8:30 a.m. - 12:30 p.m.

Introduction to Information Retrieval

Keith van Rijsbergen, University of Glasgow

This tutorial will enable participants to reach an understanding of the science and engineering underlying information retrieval research and development. It is aimed at anyone who wants to:
(a) do research in IR but has little or no basic knowledge in the subject;
(b) examine the state of research and development in IR for commercial purposes;
(c) teach IR at advanced undergraduate or postgraduate level but has no prior knowledge;
(d) think about IR but has rarely thought about it before and does not know where to start.
The tutorial will answer the following questions:
(a) What is IR?
(b) What are sensible models for IR?
(c) How to measure things in IR.
(d) What impact has IR research had on the existing technology? The tutorial will

include a demonstration of a current system. The reward for participants: a feel for the excitement of state-of-the-art in IR!

Keith van Rijsbergen was born in Holland in 1943. He was educated in Holland, Indonesia, Namibia and Australia. He took a degree in mathematics at the University of Western Australia. As a graduate he spent two years tutoring in mathematics while studying computer science. In 1972 he completed a Ph.D. in computer science at Cambridge University. After almost three years of lecturing in information retrieval and artificial intelligence at Monash University he returned to the Cambridge Computer Laboratory to hold a Royal Society Information Research Fellowship. In 1980 he was appointed to the chair of computer science at University College Dublin; from there he moved in 1986 to the Glasgow University where he is now, and indeed is head of department.

Since about 1969 his research has been devoted to information retrieval, covering both theoretical and experimental aspects. He has specified several theoretical models for IR and seen some of them from the specification and prototype stage through to production. His current research is concerned with the design of appropriate logics to model the flow of information. He is also involved in several Esprit projects concentrating on the engineering issues associated with the building of IR systems. He is a fellow of the IEE and a member of the BCS. In 1993 he was appointed Editor-in-Chief of The Computer Journal. He has also recently been appointed a member of the Advisory Committee for GMD in Germany.

Developing Information Retrieval Applications using Object Database Technology

David J. Harper, University of Glasgow

The field of information retrieval (IR) has yielded a range of techniques for efficiently and effectively storing and retrieving information items based on their text content. The utility of many application systems could be greatly enhanced by employing these techniques. Examples of such applications include office information systems, hypertext systems, and advanced information systems for government and industry. In this tutorial we describe how modern IR techniques, namely automatic indexing and best-match retrieval, can be efficiently implemented and conveniently delivered to application developers using object-oriented design and object database technology. We examine some sample applications and thereby demonstrate that the resultant IR framework, which takes the form of a class library, is both useable and extensible by application developers. We argue that our approach has a number of advantages over traditional mechanisms of delivery such as standalone packages and conventional programming language libraries. The tutorial is aimed at software designers and engineers who want to employ modern IR techniques within application systems, academics and researchers who are interested in implementing, experimenting with or prototyping IR systems, and managers wanting to assess the benefits of implementing IR applications using object database technology. Basic knowledge of IR and database concepts is assumed. A brief introduction to object-oriented concepts and object database technology will be provided.

David J. Harper is a lecturer in the Department of Computing Science, University of Glasgow, Scotland. He is a principal investigator in Glasgow on the EEC-funded ESPRIT project Comandos, which is concerned with the construction and management of distributed open systems, and he leads a major research stream on object data management services. His other research interests include information retrieval systems, object-oriented design and programming, formal specification of database systems, and office information systems. He received his B.Sc.(Hons) in Computer Science from Monash University, Australia, in 1973 and his Ph.D. in Computing Science from the University of Cambridge, England, in 1980.

Trends in Multimedia Development
Alan Griffiths, University of Sheffield

New products and applications for multimedia are being announced almost daily and there is a considerable hype over what is still a commercially insecure field with ill-defined standards and user groups. This tutorial will provide a stimulating overview of multimedia and will discuss a wide range of examples including computer-assisted-learning (CAL), image banks, electronic books and virtual reality. The currently available multimedia products and services will be examined to look for trends in development and these will be extrapolated into the future to propose products and services which will take advantage of the hardware, software and intellectual combinations to create imaginative learning and information environments. This enthusiastic view will be tempered by discussing the very real, and unresolved, problems in designing large multimedia systems. The aims of the tutorial are:

(a) To provide an overview of current and future trends in multimedia;
(b) To provide thought-provoking possibilities for information products incorporating multimedia;
(c) To stimulate discussion on how information retrieval techniques can and are being implemented into multimedia products.

The attendees for this tutorial will be people interested in the stimulating prospects that multimedia offers, but not necessarily specialists in the field. Multimedia will not provide a solution to information retrieval but it can provide front-end systems which use the algorithms and techniques outlined elsewhere in the conference.

Alan Griffiths is an independent consultant working in the areas of database and multimedia design, and is also a part-time lecturer in multimedia at the Department of Information Studies, University of Sheffield, England. Over the past ten years he has completed consultancies for a diverse group of clients ranging from heavy industry to public sector organizations. These clients have included Birmingham City Council, the Council for British Archaeology, Hewlett Packard, various parts of the British government, Basil Blackwells, Bridon Ropes and the Health & Safety Executive. His hazardous chemical software, produced for the Health & Safety Executive, is marketed by HMSO and used world-wide. His presentations on multimedia have been given to academic groups, software houses, companies and the public in England, France, Italy, Canada and Mexico.

Afternoon Tutorials: 1:30 - 5:30 p.m.

Natural Language Processing for Information Retrieval

David Lewis and Elizabeth Liddy, AT&T Bell Laboratories and
Syracuse University

Our subject is the application of natural language processing (NLP) methods to information retrieval (IR) systems. We will discuss the characteristics of human language that make IR difficult, and will provide an extensive treatment of both NLP methods and their non-NLP alternatives for addressing these characteristics. We will also discuss the newer area of using IR components to aid NLP systems. This tutorial should be of interest both to researchers interested in past work and current research directions, and to application developers and managers who need to choose practical strategies for immediate implementation. Linguistic examples will be drawn primarily from English and Japanese, with a scattering from other languages. A bibliography on NLP and IR will be distributed.

David D. Lewis (lewis@research.att.com) is a Member of Technical Staff at AT&T Bell Laboratories in Murray Hill, NJ, where his research areas are IR, NLP, machine learning, and their intersections. Lewis has implemented a variety of experimental and operational IR and NLP systems, as well as being an organizer for several large scale evaluations of such software.

Elizabeth D. Liddy (liddy@suvm.syr.edu) is an assistant professor in the School of Information Studies at Syracuse University, where her research areas are discourse linguistics, semantic disambiguation, and the use of natural language processing in information systems. She is a co-principal investigator on the DR-LINK project funded under the DARPA Tipster initiative on text retrieval and filtering.

Information Retrieval and Databases

Norbert Fuhr, University of Dortmund, Germany

Besides basic database functions such as concurrency, recovery, security and integrity, future IR systems will also need data modelling concepts for coping with structured documents and powerful query languages in order to ask for any kind of object in the database (for example authors, affiliations, journals). On the other hand, database systems are required to handle textual attributes and to provide appropriate text retrieval facilities. This tutorial will present specific database concepts which are important for both types of systems.

After a short introduction to basic database concepts, three major lines of research will be considered: modelling data structure (relational and NF2 models); modelling structure and behavior (object-oriented databases); and modelling uncertainty (Fuzzy, Bayesian and Dempster-Shafer approaches). For each of these approaches, examples for their application to IR problems will be presented.

The target audience is those who have basic knowledge in IR and now want to learn about the database aspects of the field. The course would be most useful for people designing or building IR or database systems.

Norbert Fuhr is professor in the computer science department of the University of Dortmund, Germany. He holds a diploma and doctorate in Computer Science from the Technical University of Darmstadt. He is well-known for his theoretical and experimental work on probabilistic IR models. Recently, his research interests have focused on the application of IR methods to factual databases and the integration of IR and database systems.

Non-Textual Compression in Full-Text IR Systems

Shmuel T. Klein, Bar-Ilan University, Israel

Data compression has received increased attention lately, resulting in a large number of recent publications in this area. The tutorial presents an overview of these recent developments. We shall first classify the various types of files that appear in a full-text retrieval system. The focus will be on the auxiliary structured files, such as dictionaries, concordances and various forms of bitmaps, (which may significantly enhance the retrieval algorithms) and will present state of the art approaches for compressing them. The tutorial is intended for researchers, designers and users of large textual IR systems. By the end of the tutorial, the participant should be able, for a given file, to choose the appropriate compression technique and design his/her own encoding and decoding routines.

Shmuel T. Klein received his Ph.D. from the Weizmann Institute of Science in Israel. He then spent three years at the University of Chicago and is now at Bar-Ilan University in Israel. Dr. Klein has worked on two of the world's largest natural language full-text information retrieval systems: the Responsa Project at Bar-Ilan University (in Hebrew),and the Tresor de la Langue Francaise at the University of Chicago (in French), and has published several papers on various aspects of compression in IR systems.

User Interfaces for On-line Public Access Catalogs

November 1, 1991, Library of Congress, Washington DC. Sponsored by the Library of Congress.

This conference brought together about 40 people from LC, other National Libraries, and researchers in information retrieval and interface design, most of whom were in Washington for the Annual Meeting of the American Society for Information Science. Organizers of the conference include Edward Fox, Ben Shneiderman, Gary Marchionini, Ray Larson, and Dean Wilder. A larger conference is planned for 1993, with invited papers.

For further information contact Ray Larson, Graduate School of Information and Library Studies, University of California, Berkeley, Berkeley, CA 94720. phone 510/524-2275; ray@sherlock.berkeley.edu. A brief synopsis of the 1991 meeting is available from Trudi Bellardo, School of Library and Information Science, Catholic University, Washington, DC 20064. phone 202/319-5085; fax 202/319-5574. bellardo@cua

WAIS Inc. Announcements and Technology Showcase

I am pleased to announce that WAIS Inc. will hold an Announcement and Technology Showcase on Thursday, April 29, in Menlo Park, California. This is a very important event for WAIS Inc., as we are announcing our company and product line. This event will also showcase the many uses of WAIS technology. You are cordially invited to join us.

We will announce several products and relationships that will substantially advance network publishing on the data superhighway. Bill Dunn and I, along with several of our technology partners, will speak about how WAIS and the Internet are being used for network publishing.

After the announcement, we'll have a Technology Showcase, where you'll see how WAIS is being used in business, government, education and publishing. Organizations like Lockheed, U.S. Geological Survey and TRADE will show how they're using WAIS. Ensemble will show how WAIS can be used with up-to-the-minute information from The Wall Street Journal and Dow Jones. And MCC will demonstrate their clients for Macintosh, Windows and Unix. In addition, we're working to confirm several other important participants.

Finally, each of the participants in the Technology Showcase will give a 15-minute presentation on their use of WAIS, providing more detailed information than they may be able to give at the Showcase.

This will be a truly exciting event. I hope you can join us on April 29. Details and directions follow. If you plan to attend, please RSVP to Barbara Lincoln Brooks at barbara@wais.com.

Brewster Kahle
President
WAIS Inc.

Workshops

HCI Workshop

An Agenda for Human-Computer Interaction: Science and Engineering Serving Human Needs

Report of an Invitational Workshop Sponsored
by
The National Science Foundation

Edited by:
Gary Marchionini and John Sibert

Workshop Participants

Christine Borgman, University of California at Los Angeles
Deborah Boehm-Davis, George Mason University
Stuart Card, Xerox PARC
John Carroll, IBM Watson Research Laboratory
James Foley, Georgia Institute of Technology
Rex Hartson, Virginia Polytechnic Institute and State University
John Hestenes, National Science Foundation
Scott Hudson, University of Arizona
Robert Jacob, Naval Research Laboratory
Bonnie John, Carnegie Mellon University
Tom Landauer, Bellcore
John Leggett, Texas A & M University
Clayton Lewis, University of Colorado at Boulder
Gary Marchionini, University of Maryland at College Park
Jim Miller, Hewlett-Packard Laboratories
Brad Myers, Carnegie Mellon University
Dan Olsen, Brigham Young University
Judith Olson, University of Michigan
Randy Pausch, University of Virginia
Laurence C. Rosenberg, National Science Foundation
Ben Shneiderman, University of Maryland at College Park
John Sibert, George Washington University

Table of Contents

Executive Summary

Human-computer interaction (HCI) research is concerned with the design of interfaces that allow easy and efficient use of computer systems. This report is the result of a workshop held to define the state of the art and to identify HCI research directions. The workshop was held on March 4 and 5, 1991 at George Washington University. The participants considered four areas of HCI research: theory and models; input/output devices; tools and architectures; and computer-supported cooperative work (CSCW). This report contains information about each of these areas.

HCI models are categorized as scientific or engineering, and as prescriptive or descriptive. Recommendations are made for extending and integrating scientific models and for developing new engineering models.

Input and output devices are described and their potential application in advanced interfaces discussed. Strategies for increasing user to computer bandwidth (input devices) are stressed by highlighting the use of advanced devices such as data gloves, eye trackers, and position sensors in parallel. Trends toward direct manipulation and non-command interaction styles are also noted.

Tools to aid interface designers include toolkits, user interface management systems, and user interface design/development environments. The report recommends continuing existing lines of research to develop tools that support the design process through programming by example and by automatically generating code for I/O management. Additionally, the report recommends that the overall design process become more formal by systematic application of task analysis, usability specification, rapid prototyping, and formative evaluation techniques.

HCI support for computer supported collaborative work is considered mainly from structured message and interface sharing perspectives. They include the development of shared interfaces that allow messages to be classified according to standard categories or by explicit links and development of interfaces for multiple communication channels.

Finally, there are discussions of infrastructure support for HCI. These focus on the requirements for special equipment and expertise and on difficulties associated with interdisciplinary research. Resource sharing strategies are recommended to minimize some of these problems.

1. Introduction

The National Science Foundation sponsored a workshop about research on Human-Computer Interaction (HCI). It convened many leading HCI researchers for two days of structured discussions at The George Washington University Washington, DC on March 4-5, 1991. The workshop was organized in four areas of concentration: HCI models; input/output devices and interaction styles; tools and architectures for HCI; and relationship to computer supported collaborative work (CSCW).

1.1. Motivation for HCI Research

Human-computer interaction (HCI) research is concerned with the design of interfaces that allow easy and efficient use of computer systems. Computers are used for a variety of work tasks and recreation. Users vary in skill, education and frequency of computer use. This ubiquitous use of computers leads HCI researchers to seek general models of HCI, to develop a variety of devices and techniques for facilitating computer use, and to develop new software tools to improve the design and implementation of interfaces.

HCI research is important to business and science. For example, the Computer Systems Policy Project (a group of computing industry CEOs) has identified human interfaces as one of the 16 technologies critical to the U.S. computer industry; most computer manufacturers (e.g., Apple, DEC, IBM, HP) have HCI researchers and laboratories; Apple, IBM, Sun, and other companies have defined interface specifications for software developers who create packages for their platforms; and both the Japanese and European communities are devoting extensive effort to develop HCI research projects. Also, the development of significant markets outside the U.S. is beginning to spur research and development in graphic and multilingual interfaces.

Interfaces that allow scientists in all fields to take direct advantage of high performance computing will allow them to focus on their scientific problems rather than on programming or mastering technological details. Accurate and efficient interfaces are essential in complex, life-critical situations such as nuclear power plants, air traffic control, medical and military applications. Improved interfaces also offer economic benefits in business and government by facilitating training and improving productivity. Research in HCI can also act as a catalyst in other fields by providing new contexts for the systematic study of human performance, group behavior, and information management.

2. HCI Models

Scientific disciplines employ models to study, test, and explain phenomena. This section reviews some of the models developed in HCI. The purpose is to reveal underlying factors at work in the interaction of people with computers. This knowledge should help in the HCI design and engineering process.

There are two principal roles for models in HCI: The first is to help reveal mechanisms behind the phenomena or behavior exhibited by some systems. Roughly, this could be called science. In this case there is relatively low sensitivity to the costs of producing and using the model. The second purpose is as part of a technique for building artifacts. This could be called engineering or perhaps design. In this case there is relatively high sensitivity to the costs of producing and using models, and usability is important.

HCI models can be further divided into descriptive and predictive models. The intent of descriptive models is to provide systematic information on some phenomenon. For example: what are the set of actions taken in learning to use a system? The intent of predictive models is to enable us to use information about the mechanisms at work to ask 'what if' questions. For example, if the commands of a system were to be designed in a certain way, how long would it take a user to do a certain task?

2.1. The State of the Art

The broad set of topics in HCI for which models could be developed is roughly depicted in Figure 1. Basically, these reflect (I) the use to which computers are put and the context of that use, (II) characteristics of the human that constrain interfaces, (III) the design elements of the system, and (IV) the process of design itself. In fact, models will often address themselves to combinations of these topics (e.g., the effect of command structure on learnability). Using this categorization of HCI topics, Figure 2 lists some of the principle models concerned with the direct human-machine interaction process. Models of the social and task context of computers are mainly covered in the CSCW section. Models of the design process are beyond the scope of the review, but are reflected in the tools and architectures section. The figure attempts to group models according to scientific versus engineering models and predictive versus descriptive models. It is to be understood that any such classification is only approximate since some models may serve more than one role or concern multiple topics. Also, the figure is not intended to be exhaustive, but concentrates on the major groupings of models that have appeared multiple times in the HCI literature, e.g., the ACM Conference on Human Factors in Computing

Systems and the IFIP Interact Conference.

2.1.1. Scientific Models

2.1.1.1. State Transition Models

The most sustained development of models in HCI has centered around describing and predicting the characteristics of interactive dialogue. One of the earliest of this was based on state transition models. Later versions of such models have been used to formalize the semantics and interactive processes of computer science, and formal models specifically aimed at HCI have come from this tradition. For example, Squeak is a notation for formally describing mouse-based interfaces and the PIE model has been used to analyze the properties of prototype systems at York University, where much of the work on formal models of user interfaces is centered. Researchers have described model-based systems for specifying dialogues and others model systems based on the PAC architecture, that structures the software system into a hierarchy of interacting agents. The formalization of interaction semantics is intended to allow properties of the system to be identified, proved, and guaranteed. Some of the state-transition models are intended as the basis of implementation systems.

2.1.1.2. Grammar-Based Models

The state-transition models look at interaction from an internal system point of view. Another set of models attempt to use grammars to describe the dialogue structure as seen by the user. BNF has been used to analyze the consistency and learnability of a dialogue. Multiparty grammars have been used to separate human and machine actions. The dialogue structure has been separated into four levels, syntactic, semantic, lexical, and pragmatic, and a grammar (the Command Language Grammar, CLG) proposed for describing these levels. Task-action mappings from the ideas in CLG have been used to partition the task space implied by a command language and CLG was then augmented by External Task Internal Task (ETIT), a proposal that separately described the external and internal mental task spaces and their mappings. These developments led to a Task Action Grammar (TAG) that differed from the previous grammars by replacing the

Figure 1. HCI Topics
[figure omitted]

atoms of the grammar with feature lists, as in an attribute or case grammar. This allowed descriptions to partially match and gave a way of talking about family resemblances between different parts of a dialogue or different dialogues and hence to give some technical meaning to the notion of consistency. Later developments have sought to strengthen the formal base of TAG by shifting to Jackendorff semantics (ETAG) or by adding new display concepts of the language (DTAG).

2.1.1.3. GOMS and Related Cognitive Models of Skill

A third set of models attempt to model dialogue structure in terms of the cognitive processing of the user. Goals, Operators, Methods, Selection rules (GOMS) models the sequence of user actions in tasks of routine cognitive skill. In these cases the environment for action is stable and well-learned by the human. An example is much routine text-editing. By assigning mean times (or time distributions) to the operators, method duration can be predicted. The model has been used to study method tradeoffs and method times for on-line text-editing, spreadsheets, and other systems. GOMS as originally stated did not handle learning. To model some forms of learning within the same framework a production-system form of the model called Cognitive Complexity Theory (CCT) was developed. CCT has been used to predict learning transfer between systems as well as dialogue times. A form of the model (NGOMSL) has been developed and used as a practical tool. GOMS also did not model errors. Recently, research has extended the GOMS formulation to look at errors caused by the overload of human working memory for spreadsheet programs and SQL database queries.

2.1.1.4. Unified Models of Cognition

Another set of cognitive models attempt to model human cognition more generally. The Model Human Processor summarized part of the psychological literature into a parameterized, engineering style theory capable of computing expected properties of human information processing in simple situations. A combined GOMS/Model Human Processor analysis has been used to compute stimulus-response compatibilities, and hence response times, command name recall times, and times for speech input and output. Soar is partially a descendant of the Model Human Processor and is based on methods that allow the automatic generation of subgoals and automatic learning. It has been used to model a number of cognitive tasks. GOMS analysis is beginning to be integrated with it. ACT* is based on the separation of declarative and procedural memory. Declarative memory is modeled as a semantic network and procedural memory is modeled as a set of productions. This theory has been used to give an account similar to that from the GOMS/CCT analysis of learning transfer from one system to another.

2.1.1.5. Fitts' Law Model of Input Devices

Another sustained line of HCI model development is around the use of Fitts' Law to model pointing device use. Fitts' Law says that movement time for the hand depends on the ratio of the distance to be moved and the size of the target to which the movement is directed. Movement time = K log2 [2D /W] where D is the distance moved, W is the width of the target, and K is a constant, called the Fitts Index of Difficulty. It has been found that the speed of movement of the mouse and other pointing devices is predicted by this relation. Fitts' Law has been shown to fit many sorts of manual movements and an extensive literature of Fitts' Law and its descendants have developed that includes several hundred articles.

2.1.2. Descriptive Models

In addition to models developed directly within the HCI context, work from a number of other disciplines has contributed models, especially descriptive models of phenomena of relevance to HCI. Perceptual psychology has contributed analyses of color and many other perceptual phenomena. Descriptive models of the basic human-machine interaction cycle and slips made during interaction have been developed by cognitive psychologists. Psychology and education have contributed descriptive models of user individual differences--for example, psychometric analysis of novice users and analysis of UNIX knowledge. Information science has contributed models of user interactions with information retrieval systems. On the machine side, there are a number of models that attempt to analyze and group input devices, including those that classify devices by the number of dimensions and the property sensed, by the primitive tasks they perform, and by force, position, and type of motion.

2.1.3. Engineering Techniques

Models have been the basis of a number of engineering techniques, although most design and engineering is presently done on a cut and try basis. Although intended as scientific models to understand the structure of human-machine interaction, GOMS and related models have actually been applied to a number of design problems. GOMS has been used in the design of a Xerox text editing system, to the analysis of learning an oscilloscope design at Tektronix, to the analysis and implementation of scenarios for helicopter cockpit design at NASA, and to the evaluation of a telephone company operator workstation. A simplified version of GOMS called the Keystroke-Level Model was developed to allow back-of-the envelope style calculations of method times and an executable modeling language Task Modeling Language (TML) intended for developers at IBM based on CCT and GOMS has also been developed. An interesting attempt to provide a modeling-based design technique based on this class of models--mainly, Soar, but also ACT*, TAG, and Interacting Cognitive Systems--are what are called Programmable User Models (PUMS). PUMS is a constrained cognitive architecture in terms of which a developer programs a model of his task. PUMS has been used to predict time and usability and the difficulty of learning task-action mappings. Another interesting modeling-based design technique is the Cognitive Walkthrough technique in which the CE+ model of exploratory learning is used to generate a set of evaluation questions.

Fitts' Law has been used for a number of engineering purposes. First, it has been used to devise rapid engineering tests for input devices. This is a prime case where empirical testing work is made both faster and sounder because of some theoretical basis. Second, Fitts' Law has allowed some inferences about the design space itself and is partially responsible for the commercial introduction of the mouse. Some of the formal modeling work discussed under state-transition models should also be discussed in connection with engineering models. This work is oriented toward a certain methodology of systems engineering that advocates vigorous analysis as a part of design.

2.1.4. Models of Task and Context

Models of tasks have traditionally depended on task analytic methods to identify possible states that may occur as the user moves from initial conditions to goal conditions. In such problem spaces, tasks are modeled as Markovian processes or production systems and those models are then applied during the design process to develop specific dialogue procedures for state transitions. Specific task-analytic models have been developed for processes such as text editing, information retrieval, and programming. These approaches have been successful in guiding initial design iterations, but do not take into account the total context of problem situations. An alternative approach is to consider situated actions--organizational settings for HCI. Such a holistic approach is appealing because it unites user, machine, and problem situation within a larger social context. Cognitive artifact theory links machines and problem situation to users' cognitive processing of the overall environment. Artifacts critically determine how tasks can be accomplished and what it feels like to do them. Thus, artifact analysis links up system models (artifact features), user models (psychological consequences) and task analysis (the boundary conditions, or context of the relation). For example, a system that incorporates animated demos to support learning, embodies the claim that animated demos (artifact feature) provide models for learning-by-doing user activity (psychological consequence) in a learning situation in which the learner may be wondering what sorts of actions or activities are appropriate (task context). Discussion of social aspects of context are included in the CSCW section.

2.2. Research Directions

Theoretical work on HCI has produced state-transition oriented formal models, grammar techniques for describing dialogue, information processing oriented cognitive models, Fitts' Law analysis of input device operation, models of situated problems, and a number of others. It has been easiest to get models of small, relatively context-free operations (e.g., mouse movement), and most difficult to get models of extensive user knowledge. Presently, much more effort has gone into scientific models than to models oriented towards aiding the design process. Scientific models of HCI phenomena are important for insight and for codifying the results of the field. Experience suggests, however, that explicit attention to model-based techniques usable in design is also necessary if models are to be used directly in engineering.

An issue of debate in the HCI community is the amount of effort that should be given to pursuit of a unified model of HCI and to development of new models or extensions of existing models. A unified model of HCI must be robust enough to explain performance by wide ranges of users with varying physical, cognitive, and affective characteristics; to predict optimal interface characteristics for given user-problem situations; and to specify what knowledge of an interface is necessary for a user to successfully execute complex tasks. Development of unified models that explain all aspects of HCI phenomena is desirable, but may be premature given the current state of the science (although some work has begun on the integration of scientific models, such as GOMS/CCT, Soar, and TAG).

Development of specific models, for example, perceptual/cognitive models of display devices, are important for interface design but are not well-defined in current models. One approach is to develop proposals for the relationship between modeling the small pieces of interaction most current HCI models achieve and the larger context of the problem situation.

The workshop participants believe that design decisions based on engineering models for particular users of specific systems are needed. For example, it would be useful to have models that inform designers about certain aspects of I/O devices or interface styles such as: optimal design for specific users or tasks; interface features most critical to support in a user interface management system; and human physical or cognitive characteristics that can be accommodated with devices or styles. Two specific examples are engineering advances in the characterization of design spaces (e.g., similar to studies of local area network options and corresponding perfo mance) and in compositional analysis for 2D and 3D displays.

3. I/O devices and interaction styles

Research on human-computer interaction arises in the context of two powerful information processors (human and computer) attempting to communicate with each other via a narrow-bandwidth, highly constrained interface. Research in this area attempts to increase the useful bandwidth across that interface and make best use of what there is of it by designing faster modes of communication, by reducing the amount of information that must be transmitted, and by providing better human adaptability (both physical and cognitive) to a human/machine dialogue.

Technological development in the HCI field has tended to concentrate on the computer-to-user direction (output devices in computer science terms) resulting in much higher bandwidth from the computer to the user than from user to the computer (input). Research seeking to improve the user to computer side of the dialogue by finding ways to obtain data from the user conveniently and rapidly may have a large payoff. In this regard, it should be noted that input is the source of the single biggest success story for theoretically-based research in HCI--the mouse.

3.1. State of the art

The invention of the mouse, a cheap and reliable pointing device, has stimulated much work on graphical user interfaces (GUI). GUIs represent the current state of the art in human computer interfaces. Interfaces incorporating more advanced technology, such as data gloves, position sensors, eye trackers, etc., are in their infancy and availability is primarily limited to research laboratories. Moreover, the development of these interfaces has typically been triggered by the availability of the technology rather than by a recognized need for them. We wish to move from a “gadget-driven” paradigm to a “human-driven” one. The study of human responses in a particular user-communication setting should lead researchers to say, “we need a device to transduce this particular human action to computer input,” and that kind of information should guide the deployment of efforts in input device research. The workshop participants believe research in input and output devices should start with studies of the characteristics of human communication channels and skills and proceed from there to the development of devices that communicate effectively to and from those channels.

The hardware necessary for this high-bandwidth communication is characterized by many degrees of freedom, probabilistic input, and high input data rates. Software should support real time response, input data reduction, parsing of gestures, and multiple simultaneous I/O paths. Embryonic hardware with all of these characteristics exists, but much further research is needed. The following section gives some specific examples.

3.2. Input Devices

- Three-dimensional pointing and manipulation: A magnetic tracker (e.g., Polhemus or Ascension) can provide the three-dimensional analogue of the mouse or data tablet. Other technologies, such as ultrasonic ranging, can also be used in this way. All of them are still limited in one way or another--in precision, stability, proximity to CRTs, or speed. The ideal solution may lie in sensors that observe the user, without requiring him/her to hold or wear anything.

- General gesture input: The three-dimensional mouse can be taken a step further. Rather than simply designating a location in three-space, it can allow a user to make natural, continuous gestures in space. Progress in this area requires not only a non-encumbering three-dimensional tracking technology but also a way to recognize human gestures, which occur dynamically with poor precision and repeatability.

- Simultaneous two-hand input: Aside from touch typing, computer input scenarios typically assume the use of only one hand at a time, though people are quite good at manipulating both hands, and even feet, in coordinated or different tasks. This area requires hardware that can be replicated (certain technologies permit tracking only one object at a time and are thus unsuitable) as well as research into interaction techniques and styles that make appropriate and advantageous use of both hands.

- Stereo display in conjunction with three-dimensional manipulation: A natural extension of three-dimensional tracking and gesturing is to allow the direct manipulation of virtual, displayed three-dimensional objects. This suggests stereoscopic display, but any perceivable display of depth might be adequate. The key is linking the three-dimensional input to the three-dimensional output in a faithful and convincing way.

- Virtual input devices: The notion of three-dimensional object manipulation can be extended to manipulating virtual tools, so that the user first obtains a tool (by three-dimensional direct manipulation) and then applies it to a three-dimensional virtual object. A virtual tool, can of course, metamorphose as needed for the job at hand and otherwise improve upon the properties of non-virtual tools.

- Speech: Speech input is a long standing area of research, and while progress is being made, it is slower than originally predicted, and further work remains in this field. Although the goal of continuous speech recognition remains elusive, unnatural, isolated-word speech is often appropriate and even natural for communicating with a computer, rather than another human. There is not a good understanding of how to use speech in an interface. There is not a comprehensive, principled framework for coordinating speech with other modes, such as manual input.

- Eye input: A promising area of investigation is eye movement-based input. This can be an unusually rapid and natural means of communication as well as a good example of the passive-sensing quality of a non-command interaction style. Eye-tracking technology is progressing slowly. It is still not adequate for use in practical applications for non-disabled users. An important consideration for eye movement input research is to make wise and effective use of eye movements, ideally in a non-command- based style. Eye movements, like other passive inputs (e.g., gesture, conversational speech) are often non-intentional or not conscious, so they must be interpreted carefully to avoid annoying the user with unwanted responses.

- Device taxonomy: Even without adding new devices to the range of available choices, there is considerable confusion among current position and gesture-sensing devices, touch tablets, joysticks, and mice. For example, sophisticated forms of joysticks are available for controlling six degrees of freedom, both isometric, isotonic, and in combinations. Software for using such input devices must typically be modified for each device. It might be possible to start with a taxonomy of these devices and design user interfaces with respect to the taxonomy and the user's task rather than specifically for each individual device.

The following two areas of research generated some concern in the workshop about their implications for privacy, and other user rights.

- Passive monitoring of user attitude: A user-computer dialogue could be improved if the computer knew the answer to such simple questions as, Is the user still sitting in her chair? Is he/she facing toward the computer? Is he/she using the telephone? Is another person present in the room?

- Further physiological measurements: In addition to three-dimensional position tracking and eye tracking, a variety of other physiological characteristics of the user might be monitored and the information obtained used to modify the user computer dialogue. Pupil diameter and galvanic skin response are examples of measurements that are relatively easy and comfortable to make, although their accurate instantaneous interpretation is an open question. A more difficult measure is an electro-encephalogram, although progress has been made in identifying specific evoked potential signals in real time.

3.3. Output Devices

- Graphics display packaging: The quest for a large, flat, high- resolution display screen continues, with limited success. Head-mounted displays with wide-angle optics can also provide some of the same benefits.

- Autostereoscopic displays: There are a variety of methods currently available for displaying stereo images, but most are too specialized for conventional day-to-day user-computer interaction. Graphic displays were once used only for specialized purposes. Now, they are used for routine data file manipulation. A high-quality, readily-convincing, easily fusible, high-resolution autostereoscopic (no glasses) display would make three-dimensional images similarly accessible to user interface designers.

- Touchable three-dimensional displays: A further improvement in the realism of a three-dimensional display would be to permit the user to reach out and feel the displayed object. Force and resistance feedback have particular power when combined with a convincing stereoscopic display.

- Techniques for representing complex abstract data: “Scientific visualization” issues involve both inventing new visualization techniques and understanding which techniques work best for which abstractions.

- Directional audio: It is possible to create the effect of a sound that comes from a specific location in three-space. Improvements in robustness, convenience, and user-independence are also possible.

- Force and tactile feedback: Improved force and tactile feedback may make computer-generated objects more realistic and allow the use of everyday motor skills with them.

3.4. Interaction Styles

Interaction styles include the display and selection mechanisms supported by an interface. Primary styles include: commands, form fill-ins, menus, and direct manipulation. GUIs are primarily based on direct manipulation styles that require direct selection of visual objects with immediate feedback. Touch panel and non-continuous speech interfaces are also based on direct manipulation styles. The development of advanced technology (e.g., data gloves, position sensors, etc.) has led to non-command interaction styles that support parallel human-computer exchanges along multiple channels.

3.5. Summary

Research in new input/output devices for interactive systems can lead to two kinds of benefits. The first is progress in our scientific understanding of human-computer communication: it can improve our understanding of the modes by which people can communicate with machines and lead to understanding of the characteristics of the devices, interaction techniques, and dialogue styles that allow us to exploit these modes. The second is in application of these results: it can lead to faster and more natural communication with computer systems, enable better quality and efficiency in the operation of such systems, and improve the working conditions of their users by providing them with richer and more natural means of communication.

4. Software Tools and Architecture

The tools available to the user interface architect include: pre-packaged interface objects (normally known as widgets), toolkits and interface builders which help the architect to assemble a collection of widgets into a coherent interface, and user interface management systems (UIMSs) which provide a run-time support environment for the user interface. Researchers are developing user interface design/development environments (UIDEs) which provide a more or less integrated set of tools, many of which are knowledge based. Examples of such tools include:

- tools to aid the designer in selecting widgets;
- tools for developing screen layouts and graphic presentations;
- tools to provide automatically generated help messages; and
- tools to support interface layout by demonstration.

Examples of current architectures include those provided by operating systems, window systems, object-oriented programming environments and UIMSs. One of the more interesting extensions to these traditional environments is the use of constraint systems to maintain relationships among interface objects and between interface and application objects.

4.1. Research Issues

Research issues for user interface tools will be discussed in three parts:

- (1) The interface of the future;
- (2) The interface development environment; and
- (3) The Interface Development Process.

4.1.1 The interface of the future

The form and content of computing tools can be under the direct control of their users. The end user "grabs" tools from the environment, combines them, and modifies their behavior in order to accomplish specific application tasks. These changes are not made through traditional programming activities, but through interactive techniques, much as users today build spreadsheet applications. Such malleable interfaces have two distinct advantages over the interfaces of today. First, they allow construction of the interface by the person who knows the application best--the user. Second, they support an optimal division of labor between users and programmers in co-development of systems where programming remains necessary.

The interface incorporates intelligent and unobtrusive processes, called "agents" and "critics". Agents off-load some of the tedious and repetitive work and allow the user to concentrate on the more imaginative and conceptual task level. Critics observe the user's behavior and can suggest more efficient uses of the interface.

The interface is context sensitive. This means it is both aware of its current state and also has knowledge of the current session history. It also has knowledge of both the application and the user. This context sensitivity allows the interface to provide reasoned and efficient guidance and help in learning and using the system.

4.1.2 The interface development environment

In this section tools for the designer and developer of user interfaces are discussed. There are a variety of ways in which these tools can help the developer.

4.1.2.1. Automatic generation of interfaces

Current research on user interface software is showing promising results in the automatic generation of user interfaces. This research explores a variety of possibilities such that, on the one hand, the interface is generated entirely from the source code of the application, and on the other hand, the interface is generated entirely from a demonstration of what it should look and act like without any specification of the code.

Some existing systems can generate a set of dialogue boxes and menus from a list of the commands supplied and data needed by the application program (e.g. Mickey). Others require a semantic specification of the interface in a special purpose specification language. Some sort of rule based system is then typically used to generate screen layouts, menu contents, etc., based on the code or specification.

An ideal tool would allow the designer to quickly draw a sketch of what the interface should look like and then demonstrate its behavior. The tool would learn from the demonstrations and generate an appropriate interface automatically.

Existing tools allow creation of some parts of the interface by drawing. Many tools (UIMX, NeXT interface builder and a host of others) allow designers to drag predefined widgets (such as menus, buttons, and text boxes) into place to create dialogue boxes and windows. These tools can generate program stubs for which application routines can be written. Other systems allow a limited form of actual drawing to create widgets (Peridot) and some graphical objects (Lapidary).

These tools are still very limited in scope. For example, no tool will allow text editing operations to be demonstrated or how commands can change graphic objects. Research on these tools can lead to expanding the range of interfaces that can be generated automatically and to learning how to improve their quality. The tools also need to be improved to make them easier to use and to facilitate construction by demonstration.

4.1.2.2. Easy modification of the interface design

Iterative design is important. But, current tools make it difficult to modify a design once it has been created. So, a research goal is to make it possible to easily and directly adjust the design in response to analysis and user testing of the interface or to extend the system. With many of the tools it is difficult to know what to modify to achieve a change in the interface since the tool has generated much of it automatically. Even with the more conventional tools, there are often complex interdependencies among various parts of the interface so that to change the behavior of one widget may require reprogramming a number of call-back procedures.

4.1.2.3. Tools for early parts of the design process

Most tools are basically code generators which are useful after a design has been specified. Tools are also needed for task analysis and to incorporate models into the design process. These tools can be connected to code generating tools analogous to those which currently exist so that the interface can be generated from the original requirements analyses, thus greatly facilitating iterative design.

4.1.2.4. Metrics

There is no generally accepted way of measuring the quality and usefulness of design tools. For example, Is the Macintosh toolbox easier to use than the Motif-toolkit? Some possible metrics to incorporate into user interface tool evaluation include: the time it takes to develop an interface; run time efficiency of the generated interface; and learning time for the tool. Measures of the quality of the resulting interface are also important.

4.1.2.5. Services beyond the interface design

Useful additions to developer's toolkits include items that help provide services to the end user that are frequently ancillary to the interface design itself. Some examples include: Help messages that are generated automatically; System documentation that is generated along with the interface and automatically modified when the interface is changed; Support for undo and redo capabilities; Evaluation tools to aid in analysis of designs and to measure effectiveness of the interface when it is used.

4.1.3. User Interface Development Processes

Increased usability in software systems is influenced by the user interface development process. A number of techniques and methods have been developed to support iterative design. These include: task analysis in early stages of design; design representation techniques (behavioral representations for the interface and constructional representations for the interface software); psychological design rationale for analyzing psychological claims embedded in interface designs; usability specifications; rapid prototyping; and formative evaluation (a means for testing as part of the development process).

Formal methods for a variety of steps in the design process are under development, including: new ways to get a deeper understanding of the user's tasks into the interface design, bringing task analysis fully into the interface development process, usability specification, rapid prototyping, and formative evaluation.

Specific suggested approaches to this research include field studies of real development projects, essential in defining these activities and the associated developers' roles. These studies can be used to determine, through observation and deduction, an operational model of what real interface developers presently do, as well as what they should be doing.

5. Computer Supported Cooperative Work (CSCW)

There is increasing recognition that the complexity of scientific inquiry requires collaborative efforts among scientists. Technology such as electronic mail, group writing tools, and large-screen displays play important roles in facilitating communication and data exchange among remote and local groups. Such support for communication and exchange are as vital as the computational and representation support computing provides for the conduct of science, and there are concerted efforts to coordinate remote use of scientific instruments and group communication and data exchange.

Collaboration in decision making and policy execution in government and industry has also given rise to varied CSCW efforts such as virtual meetings. CSCW tools for large-scale engineering projects are emerging. Tools to facilitate group learning have found application in K-12 as well as colleges and universities.

HCI is especially relevant to CSCW because interfaces are critical to the effectiveness, efficiency, and acceptance of technological solutions to the problems of collaboration. Conversely, CSCW has presented new challenges to HCI research because the multiplicity of users and machines involved complicates the design by demanding coordination as well as implementation of interfaces--adding new layers of bureaucracy to the overall system. Thus, it is no accident that there is a large overlap among the HCI and CSCW communities and HCI researchers have contributed to the growing collection of software known as “groupware”. In a sense, a single user collaborates with a machine through the interface and CSCW extends the interface to multiple users and machines.

5.1. HCI Issues for CSCW

Two dimensions that are critical to CSCW are time and space--whether the work is being done synchronously or asynchronously, and whether the collaborators are working in the same location or remotely. These conditions affect the degree to which interfaces must be shared and temporally constrained. Shared interfaces offer less noisy communication channels and easier data exchange, but must be more robust in terms of computing platforms and individual user differences. Shared interfaces for local groups can take advantage of wider single communication channels or multiple media since they can be augmented by the high fidelity of humans working within direct sensory proximity. Interfaces that facilitate asynchronous communication can take advantage of time delays to add computational value to messages or data by prioritizing, reformatting, or filtering mechanisms, but lack the immediate feedback synchronous interfaces allow.

A central principle in developing shared interfaces for CSCW is the notion of structured messages--interface strategies for standardizing and controlling information in CSCW. System interfaces provide users with facilities to label information according to structural categories or to form hypermedia links among other information structures. These categories are then used to improve dissemination and retrieval by the group. Implementations use various menu designs, form fill-ins, or direct manipulation techniques but the critical design decisions must be based on analysis and understanding of the group work tasks. Structured messages play key interface roles in special-purpose systems such as the Virtual Notebook for medical researchers and gIBIS for software designers and in generic systems such as the Object Lens. Mapping complex tasks to message structures is difficult in its own right, but the success of such interfaces depends on multiple users assigning appropriate labels to the information they create or use. Throughout this document it is suggested that interfaces must provide intelligent assistance to users and much research remains to be done on this problem.

The social nature of activities supported by CSCW places requirements on interface designers to provide very high bandwidth for this social communication. The common approach to this challenge is to create interfaces that employ multiple channels for supporting CSCW. Research platforms such as Video walls (e.g., Colab), virtual hallways (e.g., Cruiser), and various electronic meeting rooms (e.g., Capture Lab, etc.) illustrate just how complex and parallel human interactions are, and illustrate the need for interfaces that allow collaborators to both project and perceive emotive as well as cognitive information. Such interfaces necessarily involve parallel input and output devices and new paradigms for polylog management. In this regard, fidelity in communication channels that support CSCW has been improved by interfaces such as drawing surfaces, telepointers, and corporate memory storage and retrieval mechanisms.

Interfaces for CSCW have also illustrated a number of additional issues that motivate basic research in coordination theory and complicate continued work in HCI itself. Such issues relate to ergonomics, privacy, new standards of behavior, standards of representation, intellectual property rights, and distributed cognition.

5.2. Research Directions

Progress in developing interfaces to support CSCW is complicated by the need to share not only the content that scientists or decision makers are interested in but also the interfaces themselves. As science increasingly depends on high-performance computing it will concomitantly require communication tools that allow sharing and discussion in real time, three-dimensional motion images, highly structured data sets and maps, real-time sketches, and voice or text information. Given the bandwidth of future networks, interfaces to create, retrieve, send, display, edit, discuss, and store such information must be designed and tested. Interfaces are needed: that allow users to work in parallel without being overloaded or confused; for managing multiple inputs and outputs and facilitating human turn taking exchanges; that seamlessly integrate multiple media; that provide easily manipulatable and varied levels of private and public broadcasts; and that take advantage of human communication channels such as gestures, eye movements, and voice intonation.

6. Infrastructure for HCI Research and Development

All scientific fields require a variety of support systems that facilitate research. These include: instruments and tools for conducting research; professional societies; journals; curriculums rooted in the principles and techniques of the field; and mechanisms for attracting new scientists to the discipline. HCI infrastructure development is complicated by the fact that the best research in HCI is highly interdisciplinary. It does not fall directly within the current disciplinary structure of Computer Science or Psychology, but right at the boundary between the two. Institutional pressures tend to lead researchers toward the centers of their disciplines, not the edges. For example, it is surely easier to achieve tenure in a department by doing work that is close to the center of its discipline.

Base-level support for HCI research includes workstations and some funds for software, not differing from other areas of Computer Science. But many projects require significant investment in equipment beyond this base. Examples of technologies requiring special equipment that will play an increasing role in HCI research include virtual reality, teleoperations, digital photography, and hypermedia. In addition, empirical user studies often require special facilities for collecting data from groups of participants simultaneously, so that multiple stations and video recording are needed.

Acquiring staff support to operate, maintain, and adapt equipment and software is expensive and requires a commitment of continuity of employment. Universities fund staff support positions for major externally-funded projects, but not usually for small ones, such as have been typical in HCI.

Many scholarly journals serve the HCI field and new journals have appeared in the past few years, including a new abstracting publication. Likewise, professional societies such as SIGCHI hold well-attended conferences that include a mix of theory and practice.

The ACM SIGCHI curriculum recommendations call for single course offerings at the undergraduate and graduate levels. Introducing ideas and methods from HCI into undergraduate introductory courses is another idea. Yet another possibility is joint curriculum development with other areas of CS, in order to help integrate HCI into the overall field. For example, HCI material can be used in database and software engineering courses. Useful material exists in videos produced by SIGGRAPH and SIGCHI, but is not well packaged for instructional use. Finally, no widely accepted textbook has emerged.

6.1. Leveraging Infrastructure Resources

There are opportunities for resource sharing between HCI projects. Staffing needs could be reduced to some extent, and overall research productivity increased, by pooling some kinds of work across projects. For example, research in I/O devices requires that prototype devices be designed and built; one laboratory could do these jobs and make multiples of the devices available to other groups. As another example, researchers doing cognitive modelling could share models more effectively if resources were available to produce distribution versions of software and provide some level of consulting and support.

“Virtual center” project structures could provide useful support for HCI research.

Such support could come from the establishment of large research centers,such as NSF Engineering Research Centers and Science and Technology Centers. Hub projects within virtual centers could provide infrastructure support. Virtual centers could include one or more hub projects funded at a higher level than other projects. Such projects would undertake to perform hardware and software development as required for the center as a whole, to distribute devices and software. The larger funding for hub projects could be used to leverage university staff support at the hub sites.

Smaller, more flexible, funding arrangements would also be important for resource sharing. One such model of sharing is exemplified by the community of researchers who have developed the Soar cognitive model. They have developed a kind of “virtual center” in which a high degree of sharing of work, information, and ideas has been achieved without any collective funding arrangement. Soar researchers raise funds separately for their own projects but then participate in well-organized community-wide workshops and share software development.

7. Summary

This report summarizes the state of the art and identifies research directions in HCI.

A variety of scientific and development models of users, systems, and tasks have been developed and extended. These models serve as the basis for a cumulative science of HCI. Progress toward integrating some of the scientific models has begun and payoffs can be expected from the development of design and engineering models or taxonomies based on scientific models.

Many devices for input (e.g., gesture, speech, gaze, etc.) and output (e.g., autostereoscopic displays, 3D displays, etc.) have been developed. Progress has also been made in visualization techniques and the development of alternative modes of interactions such as directional audio and force and tactile feedback. What remains problematic is mapping particular devices to tasks and users and the integration of devices and non-command interaction styles. Strategies for natural integration of parallel I/O devices are also required.

Toolkits and user interface management systems have been developed to support interface designers. New research aims to discover ways to support end user programming and to develop higher levels of software/interface abstraction. It is hoped this will lead to broader reusability of interface code. Progress is also being made toward improving the overall development process (e.g., iterative refinement, usability specifications, evaluation).

HCI research has supported CSCW through the development of interfaces for structured messages, development of real-time interfaces, and the definition of shared standards and local customizable agents. CSCW and HCI also share theoretical models for social context vis-a-vis human-computer interactions.

Recommendations for improving the infrastructure to support HCI research and education include ways to share resources and expertise in order to: develop laboratories with special equipment and staff; foster cooperation and support from professional organizations; and develop curriculums and programs for HCI education.

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Workshop on Hyperbase Systems

May 1992

Executive summary

Advanced information management systems of the future will not resemble the systems of today. Ubiquitous access to high-speed computer networks will lead to massive data and process distribution and entirely new forms of collaborative work processes. New media and new data types will revolutionize computing environments and require petabyte storage capabilities. Even today we see specifications for new information management systems that call for terabyte storage of multimedia data and national network access. Future digital electronic libraries will allow scholarly access to the world's literature through local, national and global networks.

Requirements for advanced information management applications are overwhelming existing database theory and practice. Current architectures of database management systems will not scaleto terabytes. Existing data models and database technology provide inadequate support for these new environments, and, as a result, hyperbases (hypermedia databases) are emerging as an important new area of research. We are currently at a crucial point in the development of hyperbase systems. Fundamentally new models, architectures, data representations and algorithms are required. Although several researchers have designed new data models and architectures for hyperbases, the field has reached consensus on neither.

This report presents the results of a workshop held to define the state of the art and to identify research directions for the hyperbase community. The workshop brought together 24 participants from the areas of hypermedia, database, collaborative and information retrieval systems for an intensive two-day workshop. The workshop was held on October 15 and 16, 1992 in Washington, D.C. at the Vista hotel. This report identifies critical research issues facing hyperbase system researchers, current progress on the issues, potential methods of approach (including literature citations) and a general research agenda for the field.

The hyperbase system architectures discussed at the workshop can be characterized as being large-scale (tens of terabytes), open, distributed, heterogeneous and extensible with capabilities for computation. Typical application environments discussed were archival electronic libraries, large-scale collaborative systems and large engineering enterprises. The workshop concentrated on hyperbases and did not include hypermedia environments or user-interface issues except as they might impact the hyperbase. The participants considered the following six key topical areas: models and architectures; node, link, and structure management (data and metadata management); browsing/search and query; version control; concurrency control, transaction management, and notification control; impacts of application environments on hyperbases; and, core functionality of a hyperbase management system. This report contains the summary of the discussion of the issues in each of the six key topical areas.

The workshop report will be available in Spring, 1993 from the Hypermedia Research Laboratory at Texas A&M University.

Workshop on Hypermedia and Hypertext Standards 22nd-23rd April Amsterdam

A major international workshop to discuss hypermedia standards issues will take place 22nd-23rd April 1993 at the World Trade Centre, Amsterdam.

The workshop is sponsored by the Commission of the European Communities (DG XIII) as part of the IMPACT programme for the development of the European information market - Open Information Interchange initiative. OII seeks to improve awareness of information coding standards and promote their use in the electronic-services market.

Sessions will be devoted to structure standards (Hytime, MHEG, AVI, ODA-hyper extensions) and content standards (MPEG,JPEG,JBIG,GDID,IIF,etc.) as well as applications.

Further details and registration forms can be obtained from the organisers: Johan van Halm, c/o HYPWKS, PO Box 688, 3800 AR Amersfoort, Netherlands. fax +31 33 650945

Information Access and the Networks - A Research Workshop

(held after SIGIR'93)

July 1, 1993 --- Pittsburgh, PA

Information access involving networks is one of the most important growth areas in the broad field of information technology. User demand has caused a massive growth in the size of the Internet and the amount of information accessible on it. This has made it imperative to develop new technologies to provide an infrastructure for this new information space. This workshop will bring together researchers and developers to discuss network-based information services in both general and specific terms, drawing upon those attending ACM SIGIR '93 and the communities related to:
- Archie
- Digital Libraries

* Gopher
* HyperPage
* Knowbots
* NCSA Mosaic
* NNTP/Usenet
* Prospero
* Veronica
* WAIS
* WWW (WorldWideWeb)
* Z39.50

along with other related initiatives, protocols, systems, and services.

Attendees will include persons with an active interest in network-based information systems and relevant research.

Presentations will include design and implementation of client-server architectures, resource discovery, distributed file systems and services, development of integrated network tools, and innovative applications of more basic technologies, such as bulletin board systems and electronic mail.

The workshop format involves a plenary session from 8:30-11:30 a.m. with invited speakers, each of them addressing a major theme in the area of wide-area networking. After some discussion, the workshop will break up into groups, starting with a working lunch. The organization of these groups and assignment of participants to them will be based on a short interest statement provided by each participant.

The workshop will conclude with brief summary presentations by group leaders. Notes from the plenary talks and interest statements will be provided to attendees and made available for on-line access after the workshop.

In addition to discussion of the initiatives, protocols, systems, and services listed above, other topics of interest include:

- scaling - to handle more users, more databases or documents, bigger databases, larger data items (e.g., multimedia)
- efficiency - algorithms, data structures, simulations, experiments
- effectiveness - evaluation methods, studies, designs
- interfaces - platforms, user needs, development methods, evaluations, integration with other applications
- limitations and future plans for enhancement

- progress in developing standards or using existing ones
- technical details relating to protocols, implementations
- user studies, application surveys, innovative uses
- integration - plans, designs, requirements, implementations of systems to integrate information access over the networks
- novel applications using network-enabled information access technology.

If you are interested in attending, please prepare a 1-page statement of interest, covering your background, experience, and topics of interest. Priority, in case of limited space, will be given to SIGIR attendees and those who have submitted interest statements.

The Program Committee includes:
George Brett, CNIDR
Edward Fox, Chair (of workshop, SIGIR), Virginia Tech
Jose-Marie Griffiths, U. Tenn.
Brewster Kahle, WAIS Inc.
Clifford Lynch, U. California
Craig Stanfill, Thinking Machines
Craig Summerhill, Coalition for Networked Information
Chris Tomer, Co-chair and local arrangements coordinator

Interest statements should be submitted by May 15. They may accompany registration forms or be sent directly to:
Chris Tomer
School of Library and Information Science
University of Pittsburgh
Pittsburgh, PA 15260, USA
tel: (412) 624-9448; fax: (412) 648-7001
email: ianet@lis.pitt.edu

Further information is available from:
Ed Fox, (fox@fox.cs.vt.edu; foxea@vtcc1.bitnet) or
Chris Tomer (ianet@lis.pitt.edu)

Cost for this one-day session is $50,
which includes coffee breaks and lunch.

National Research and Education Network (NREN) Workshop

Monterey, California
September 16-18, 1992

Sponsored by

Computing Research Association
Educom
IEEE U.S. Activities Board

With assistance from the NSF.

Major Issues
(Taken from the Executive Summary of the Proceedings of the NREN Workshop)

The workshop provided time for lively discussion both in small groups and in plenary sessions. A number of conclusions about major issues were shared widely among the participants:

The High-Performance Computing Act and the current Administration's High Performance Computing and Communications program are important first steps toward the realization of a national network. The Congressional intent to "promote the more rapid development of an information infrastructure" should be met through wide participation in the emerging NREN system.

- The NREN should be more than a program supporting high performance computing. It has the potential to:

- facilitate development of the National Information Infrastructure

- provide tools for increasing the effectiveness of research, education and technology transfer at all levels, and

- demonstrate network applications and technologies which can aid in addressing critical social needs.

- Some members of Congress and others who have been involved with the prior development of research networks appear to assume that the NREN will be a federal network of dedicated physical links. In contrast, the workshop participants see the NREN as a national network program whose advanced transmission requirements will be met by the rapidly evolving commercial communications infrastructure of the country.

- More emphasis should be placed on making the NREN a truly national program which includes strategic partners in higher education, state government and industry.

Recommendations on Policy Questions

The specific Congressional questions serve to test the commonality of visions of the network, its services, its governance and funding. The workshop discussion of the questions reflected general agreement that:

- Historical models for the evolution of the NREN such as the highway system, telephone system, national electrical power grid and the agricultural extension system all contain elements which may be useful in developing the NREN. However, workshop participants believe that historical precedent must be balanced with empirical experience gained from actual network implementation.

The final shape of the NREN, and its balance of public and private activites, will be unique.

- Federal funds for the existing interim NREN (principally NSFNET) have been significantly leveraged by non-federal funds provided though a variety of means such as user fees, industry support, state and university investment. However, the total funding currently available falls far short of the amount needed to realize the goal stated in the Act of connecting research, education and libraries at all levels in every state.

- NREN governance currently includes Congressional oversight of an Administration program involving multiple agencies as well as coordinating and advisory committees. While this structure may work for the current federal program, it is not likely to be sufficient for the development of the NREN as a national program, since major investors and stakeholders currently participate at most in an advisory capacity.

- As the NREN and other large scale computer networks continue to expand and gain use for a wide range of activities, both institutional and individual, the Congress must be sensitive to possible needs for revision and strengthening of federal statues, regulations and policies covering security and intellectual property (i.e., copyright) protection.

- Charging for commercially provided services is technologically feasible and can be dealt with during NREN implementation.

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NSF Workshop on Visual Information Management Systems

February 24-25, 1992

Redwood, CA

Excerpt from Workshop Report:

One of the most important technologies needed across many traditional areas as well as emerging new frontiers of computing, is the management of visual information. For example, most of the Grand Challenge applications, under the High Performance Computing and Communication (HPCC) initiative, require management of large volumes of non-alphanumeric information, computations, communication, and visualization of results. Considering the growing need and interest in the organization and retrieval of visual and other non-alphanumeric information, and in order to stimulate academic projects in this area, a workshop on Visual Information Management Systems (VIMS) was sponsored by the National Science Foundation. This workshop was held in Redwood, CA, on Feb 24-25, 1992. The goal of the workshop was to identify major research areas that should be addressed by researchers for VIMS that would be useful in scientific, industrial, medical, environmental, educational, entertainment, and other applications.

Selected Legislation in the 103rd Congress Related to Electronic Information Delivery

Infrastructure Development

H.R. 707 (Dingel)
Companion Measure S.335
Emerging Telecommunications Technologies Act of 1993

Amends the National Telecommunications and Information Administration Organization Act to require the Assistant Secretary of Commerce for Communications and Information and the Chairman of the Federal Communications Commission (FCC) to conduct, at least biannually, and to report to specified congressional committees, the FCC, and the Secretary of Commerce annual on, joint electromagnetic spectrum planning with respect to: (1) future spectrum requirements for public and private uses and the allocation actions to accomodate those uses; and (2) actions to promote the efficient use of the spectrum. Introduced February 2, 1993. Referred to the House Committee on Energy and Commerce, Subcommittee on Telecommunications and Finance. Passed House on March 2, 1993. Received in Senate and Referred to Senate Committee on Commerce, Science and Transportation on March 3, 1993.

These bills are incorporated in H.R.2264, the Omnibus Budget Reconciliation Act of 1993.

H.R. 1091 (Clinger)

A bill to establish the Commission on Information Technology and Paperwork Reduction. Introduced on February 24, 1993. Referred to House Committee on Government Operations, Subcommittee on Legislation and National Security. Establishes the Commission on Information Technology and Paperwork Reduction in order to minimize the information reporting burden imposed by the Federal Government, consistent with the information needs of the Government for policy purposes. Lists specific Commission functions, which include the study and review of former Commission on Paperwork recommendations for paperwork reduction.

Requires a final Commission report to Congress and the President and action by the Office of Management and Budget on Commission recommendations.

H.R. 1312 (Boucher)
Local Exchange Infrastructure Modernization Act of 1993

A bill to recognize the unique status of local exchange carriers in providing the public switched network infrastructure and to ensure the broad availability of advanced public switched network infrastructure.

Amends the Communications Act of 1934 to require the Federal Communications Commission (FCC) to exercise its authority to: (1) preserve and enhance universal telephone service at reasonable rates; (2) achieve universal availability of advanced network capabilities and information services; (3) assure a seamless nationwide distribution network through joint network planning, coordinations, and service arrangements between and among local exchange carriers (LECs); (4) maintain high standards of quality for advanced network services; and (5) assure adequate communications for the public health, safety, defence, educations, national security, and emergency preparedness.

Introduced on March 11, 1993. Referred to the House Committee on Energy and Commerce, Subcommittee on Telecommunications and Finance and to the House Committee on the Judiciary, Subcommittee on Economic and Commercial Law.

H.R. 1504 (Boucher)
Communications Competitiveness and Infrastructure Modernization Act of 1993

A bill to encourage the modernization of the Nation's telecommunications infrastructure, to promote competition in the cable television industry and to permit telephone companies to provide video progamming. Introduced on March 29, 1993. Referred to House Committee on Energy and Commerce, Subcommittee on Telecommunications and Finance.

Amends the Communications Act of 1934 to allow a common carrier to provide video programming directly to subscribers in its telephone service area through its own facilities or an affiliate. Authorizes the common carrier to provide channels of communications, pole line conduit space, or other rental arrangements to any entity which is directly or indirectly owned, operated, or controlled by it if such facilities or arangements are used for, or in connection with, the provision of video programming directly to subscribers in the telephone service area of the common carrier.

Prohibits a common carrier from providing video programming directly to subscribers in its telephone service area unless the programming is provided through a separate video programming affiliate. Requires business arrangements and transactions between a common carrier and its video programming affiliate to be pursuant to regulations prescribed by the Federal Communications Commission and to be without cost to the telephone service ratepayers of the carrier.

Requires any common carrier which provides video programming directly to subscribers through an affiliate in its telephone service area to establish a basic video dial tone platform.

Requires any such common carrier to make a maximum of 75 percent of the equipped capacity of its basic video dial tone platform available to unaffiliated video program providers. States that the carriage of local broadcast signals shall not constitute the provisions of affiliated video programming under this Act.

Sets forth prohibitions on: (1) cross-subsidization between telephone service and video programming by common carriers; and (2) common carrier buyouts of cable systems located in the carrier's telephone service area.

Requires the Commission to convene a Federal-State Joint Board to establish practices, classifications, and regulations necessary to ensure proper jurisdictional seperation and allocation of the costs of providing broadbound services, including affiliated video programming.

Makes provisions of the Act inapplicable to video programming provided in a rural area by common carrier that provides telephone exchange service in such area.

H.R. 1613 (Collins, C.)
Telecommunications Policy Coordination Act of 1993

A bill to improve coordination in the formulation of telecommunications policy within the executive branch. Introduced on April 1, 1993. Referred to House Committee on Energy and Commerce, Referred to Subcommittee on Telecommunications and Finance.

Establishes an Office of Telecommunications Policy (OTP) in the Executive Office of the President. Directs OTP to: (1) prepare national telecommunications policy options; (2) serve as the principal advisor to the President on telecommunications issues; (3) arbitrate telecommunications policy disputes among Federal agencies; (4) communicate the views of the agencies and the President concerning telecommunications policy to the Federal Communications Commission (FCC) and the Congress; and (5) monitor developments in telecommunications technology. Requires the Director of OTP to: (1) establish an Advisory Committee on Telecommunications Policy; and (2) report to the President and Congress annually on OTP activities and on emerging trends in telecommunications.

Requires the FCC to report to the President and the Congress on its reasons for taking any final action which is inconsistent with views received from OTP.

H.R. 1757 (Boucher)
High Performance Computing and High Speed Networking Applications Act of 1993
National Information Infrastructure Act of 1993

A bill to provide for a coordinated federal program to accelerate development and dissemination of applications of high performance computing and high-speed networking. Introduced April 21, 1993. Referred to House Committee on Science, Space, and Technology, Subcommittee on Science. Hearings held by Subcommittee on May 6 and 11, ordered and reported as amended on June 30, 1993.

Amends the High-Performance Computing Act of 1991 to direct the Federal Coordinating Council for Science, Engineering, and Technology to: (1) establish an interagency applications program to develop applications of computing and networking advances under the National High-Performance Computing Program; and (2) develop a Plan for Computing and Networking Applications which shall identify application program goals and priorities and set forth specific Federal agency responsibilities.

Requires the Plan to: (1) foster local network access programs and their connection with Internet; and (2) develop projects and technologies in the fields of education, health care, libraries, and government information access.

Provides for the establishment of a high performance computing and applications advisory committee.

H.R. 2264 (Sabo)
Companion Measure, S. 1134
Omnibus Budget Reconciliation Act of 1993
Licensing Improvement Act of 1993
***Emerging Telecommunications Technologies Act of 1993**

A bill to provide for reconciliation pursuant to section 7 of the concurrent resolution on the budget for fiscal year 1994. Incorporates H.R. 707 and S. 335. Introduced on May 25, 1993. House Committee on the Budget Reported an Original Measure, report No: 103-111. Passed House on May 27, 1993, Passed Senate in lieu of S. 1134 on June 25, 1993, Senate also requested a conference.

S. 4 (Hollings)
Companion Measure H.R. 820
Manufacturing Technology and Extension Act of 1993
Information Infrastructure and Technology Act of 1992
National Competitiveness Act of 1993
Wind Engineering Program Act of 1992

A bill to promote the industrial competitiveness and economic growth of the United States by strengthening and expanding the civilian technology programs of the Department of Commerce, amending the Stevenson-Wydler Technology Innovation Act of 1980 to enhance the development and nationwide deployment of manufacturing technologies, and authorizing appropriations for the Technology Administration of the Department of Commerce, including the National Institute of Standards and Technology. Introduced on January 21, 1993. Referred to Senate Committee on Commerce, Science and Transportation. Committee hearings held February 24, 1993 and March 25, 1993. Ordered and reported as amended on May 25, 1993.

TITLE III--CRITICAL TECHNOLOGIES, Sec. 313. Technical Amendments ...(3) The Office of Technology Monitoring and Competitive Assessment is authorized to (A) act as a focal point within the federal government for the collection and dissemination, including electronic dissemination, of information on foreign process and product technologies, including information collected under the Japanese Technical Literature Program; (B) coordinate the extensive foreign technology monitoring and assessment activities already under way in the federal government; (C) act as an electronic clearinghouse for this information or otherwise provide this function.

S. 335 (Innouye)
Companion Measure H.R. 707
Emerging Telecommunications Technologies Act of 1993

A bill to require the Secretary of Commerce to make additional frequencies available for commercial assignment in order to promote the development and use of new telecommunications technologies. Introduced on February 4, 1993. Referred to Senate Committee on Commerce, Science and Transportation, Subcommittee on Communications. Hearings held on March 17, 1993.

Directs the Assistant Secretary of Commerce for Communications and Information and the Chairman of the Federal Communications Commission (FCC) to conduct joint spectrum planning meetings. Directs the Secretary of Commerce to: (1) identify bands of frequencies that may be reallocated to commercial users; and (2) establish a related advisory committee. Directs the FCC to submit to the President and the Congress a plan for the distribution of the reallocated banks of frequencies under this Act.

Authorizes the President to reclaim reallocated bands of frequencies for reassignment to government stations.

This bill was also incorporated in H.R. 2264, the Omibus Budget Reconciliation Act of 1993.

S. 473 (Johnston)
Department of Energy National Competitiveness Technology Partnership Act of 1993

A bill to promote the industrial competitiveness and economic growth of the United States by strengthening the linkages between the laboratories of the Department of Energy and the private sector and by supporting the development and application of technologies critical to the economic, scientific and technological competitiveness of the United States. Introduced on March 2, 1993. Referred to Senate Committee on Energy and Natural Resources, Subcommittee on Energy Research and Development. Committee hearings held on March 18, 23 and 24, 1993. Reported to Senate (Amended) by Senate Committee on Energy and Natural Resources On June 24, 1993, report no.:103-69.

Amends the Department of Energy Organization Act to authorize the Secretary of Energy and the directors of departmental laboratories (laboratoires operated by or on behalf of the Department of Energy (DOE) or facilities that would be considered to be laboratories under the Stevenson-Wylder Technology Innovation Act of 1980) to enter into any partnership that will enhance the economic, scientific, or technological competitiveness of U.S. industry.

Directs the Secretary to develop a multi-year critical technology strategy for each critical technology listed in the National Critical Technologies Report. Authorizes the Secretary and the directors of departmental laboratories to enter into partnerships that build on the core competencies of the laboratories to conduct research, development, demonstration, or commercial application activities in areas listed in Report or in energy efficiency or supply, high-performance computing, the environment, human health, advanced manufacturing technologies, advanced materials, transportation, space, or quality technologies, or technologies listed in the annual defense critical technologies plan.

Amends the High-Performance Computing Act of 1991 to provide for cost-shared projects involving DOE or DOE laboratories and non-Federal entities to test and apply high-performance computing and high-speed networking technologies.

S. 570 (Grassley)
Local Exchange Infrastructure Modernization Act of 1993

A bill to recognize the unique status of local exchange carriers in providing the public switch network infrastructure and to ensure the broad availability of advanced public switched network infrastructure. Introduced on March 11, 1993. Referred to Senate Committee on Commerce, Science, and Transportation.

Amends the Communications Act of 1934 to require the Federal Communications Commission (FCC) to exercise its authority to: (1) preserve and enhance universal telephone service at reasonable rates; (2) achieve universal availability of advanced network capabilities and information services; (3) assure a seamless nationwide distribution network through joint network planning, coordination, and service arrangements between and among local exchange carriers (LECs); (4) maintain high standards of quality for advanced network services; and (5) assure adequate communication for the public health, safety, defense, education, national security, and emergency preparedness.

Requires the FCC to prescribe regulations that require: (1) joint coordinated network planning, design, and cooperative implementation among all LECs in the provision of public switched network infrastructure and services; (2) development of standards for interconnection between the LEC public switched network and others by appropriate standard-setting bodies; and (3) a LEC to share public switched network infrastructure and functionality with requesting LECs which serve a geographic area for which they lack economies of scale or scope for the particular required network functionality.

S. 1086 (Danforth)
Telecommunications Infrastructure Act of 1993

A bill to foster the further development of the Nation's telecommunications infrastructure through the enhancement of competition. Introduced on June 9, 1993. Referred to Senate Committee on Commerce, Science and Transportation.

Government Information

H.R. 629 (Owens, M.)
Improvement of Information Access Act of 1993

A bill to amend title 44, United States Code, to promote improved public dissemination of Gevernment information. Introduced on January 26, 1993. Referred to House Committee on Government Operations, Subcommittee on Information, Justice, Transportation and Agriculture.

Requires agencies to: (1) disseminate information in diverse modes and through appropriate outlets that will permit and broaden public access to Government information; and (2) use depository libraries, national computer networks, and other distribution channels that improve and assure free or low-cost public access to Government information.

H.R. 1328 (Rose)
Companion Measure S.564--P.L. 103-40
Government Printing Office Electronic
Information Access Enhancement Act of 1993

A bill to establish in the Government Printing Office a means of enhancing electronic public access to a wide range of Federal electronic information. Introduced on March 11, 1993. Referred to House Committee on House Administration. On April 1, 1993 reported to House by Committee, report no.:103-51.

Requires the Superintendent of Documents, under the direction of the Public Printer, to establish a means for providing the public with on-line access to electronic public information of the Federal Government.

Sets forth guidelines for determining fees for accessing such information. Permits depository libraries to access information through such means without charge.

Requires the Public Printer to report to the Congress on the savings resulting from such on-line public access to government information and on the status of the system providing such access.

S. 560 (Nunn)
Paperwork Reduction Act of 1993

A bill to further the goals of the Paperwork Reduction Act to have the Federal agencies become more responsible and publicity accountable for reducing the burden of Federal paperwork on the public, and for other purposes. Introduced on March 10, 1993. Referred to Senate Committee on Governmental Affairs.

TABLE OF CONTENTS
Title I: Authorization of Appropriations
Title II: Reducing the Burden of Federal Paperwork on the Public
Title III: Enhancing Federal Agency Responsibility and Accountability for Reducing the Burden of Federal Paperwork
Title IV: Enhancing Government Responsibility and Accountability for Reducing the Burden of Federal Paperwork
Title V: Enhancing Agency Responsibility for Sharing and Disseminating Public Information - Provides for Government-wide standards for sharing and disseminating public information.

Imposes certain responsibilities on Federal agencies for sharing and disseminating public information.

Abolishes the Federal Information Locator System established in the Office of

Information and Regulatory Affairs and replaces it with a system in each agency for providing access via electronic and other means to a comprehensive inventory of agency information dissemination products.

Provides for the use of electronic information collection and dissemination techniques to reduce the Federal paperwork burden.

S. 564--P.L. 103-40 (Ford)
Companion Measure, H.R. 1328
Government Printing Office Electronic Information Access Enhancement Act of 1993

A bill to establish in the Government Printing Office a means of enhancing electronic public access to a wide range of Federal electronic information. Introduced on March 11, 1993. Referred to Senate Committee on Committee on Rules and Administration. Passed Senate on March 22, 1993, passed House on May 25, 1993, signed into law on June 8, 1993.

Requires the Superintendent of Documents, under the direction of the Public Printer, to establish a means for providing the public with on-line access to electronic public information of the Federal Government.

Sets forth guidelines for determining fees for accessing such information. Permits depository libraries to access information through such means without charge.

Requires the Public Printer to report to the Congress on the savings resulting from such on-line public access to governmnet information and on the status of the system providing such access.

S. 681 (Glenn)
Paperwork Reduction Reauthorization Act of 1993
Regulatory Review Sunshine Act of 1993

A bill to amend chapter 35 of title 44, United States Code, relating to Government paperwork reduction, to modify the Federal regulatory review process. To ensure the greatest possible public benefit from information collected, maintained, used, disseminated, and retained by the federal government. Introduced on March 31, 1993. Referred to Senate Committee on Governmental Affairs.

Educational Applications

H.R. 856 (Owens, M.)
Educational Research, Development, and Dissemination Act

A bill to improve education in the United States by promoting excellence in research, development, and the dissemination of information. Introduced on February 4, 1993. Referred to House Committee on Education and Labor, Subcommittee on Select Education and Civil Rights. Subcommittee hearings held on May 27, 1993. Field hearings held in New York, New York on June 19, 1993.

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Title I: General Provisions Regarding Office of Educational Research and Improvement
Title II: National Educational Research Policy and Priorites Board
Title III: National Research Institutes
Title IV: National Education Dissemination System
Title V: National Library of Education
Title VI: Leadership for Educational Technology

Title IV: - Amends GEPA to establish within OERI an Office of Reform Assistance and Dissemination (Dissemination Office), through which the Secretary shall carry out a national education dissemination system for school improvement. Provides for Dissemination Office functions and duties, including: (1) identification, designation, and dissemination of exemplary and promising programs including certain training, technical, and financial assistance; (2) 16 Education Resources Information Clearinghouses; (3) dissemination through new technologies; (4) an electronic network for sources of materials and research about teaching and learning for improving nationwide education (SMARTLINE) to link various educational research and other entities; (5) an electronic networking and resource-sharing for school improvement program of grants to State education agencies; (6) a networked system of the ten regional educational laboratories; (7) an America 2000 Communities Special Assistance Program, with grants for Learning Grant Institutions and District Education Agents within eligible communities, development of a comprehensive America 2000 plan for assuring educational success for all students in the community, and implementation of a community-wide plan for educational improvement; (8) the Teacher Research Dissemination Network (regional partnerships for teacher change agents); and (9) the existing National Diffusion Network and its Developer-Demonstrator and State Facilitator projects.

H.R. 2268 (Brown)

A bill to facilitate the development of an integrated, nationwide telecommunications system dedicated to instruction by guaranteeing the acquisition of a communications satellite system used solely for communications among State and local instructional institutions and agencies and instructional resource providers. Introduced on May 26, 1993. Referred to House Committee on Education and Labor, Subcommittee on Elementary, Secondary and Vocational Education.

S. 264 (Bingaman)
Technology for the Classroom Act of 1993

A bill to establish a Classrooms for the Future Program. Directs the Secretary of Education to award competitive grants to eligible consortia to develop instructional programs and technology-based systems for complete courses or units of study for a specific subject and grade level, if these are commercially unavailable locally. Introduced on January 28, 1993. Referred to Senate Committee on Labor and Human Resources.

S. 1040 (Bingaman)
Technology for Education Act of 1993

A bill to support systemic improvement of education and the development of a technologically literate citizenry and internationally competitive work force by establishing a comprehensive system through which appropriate technology-enhanced curriculum, instruction, and administrative support resources and services, that support the National Education Goals and any national education standards that may be developed, are provided to schools throughout the United States. Introduced on May 27, 1993. Referred to Senate Committee on Labor and Human Resources.

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Distribution

Title V: Educational Technology Research, Development and Assessment

Library Applications

S.345 (Pell)
Library of Congress Fund Act of 1993

A bill to authorize the Library of Congress to provide certain information products and services.

Expresses the intent of the Congress that core Library of Congress services shall continue to be provided at no cost.

Defines: (1) “core library products and services” as domestic interlibrary loan and information products and services customarily provided by libraries to users at no charge; and (2) “specialized library products and services” as specified customized information products and services that exceed core services, that are not national library products and services, and that are designed for individuals or discrete groups of persons or entities.

Declares that this Act shall not modify Federal copyright law.

Introduced on February 4, 1993. Referred to Senate Committee on Committee on Rules and Administration. Committee Consideration and Mark-up Session held on May 20, 1993. Reported to Senate (amended) by Senate Committee on Rules and Administration on May 26, 1993, report no.:103-50. Questions were raised by Senators DeConcini and Feinstein which resulted in a meeting of all interested parties including House and Senate Judiciary Committee staff on June 4. Discussions focused upon amendments proposed by the information and publishing industries.

S. 626 (Kerrey)
Electronic Libraries Act of 1993

A bill to establish a system of State-based electronic libraries. Provides for a system of State-based electronic libraries which (1) allows delivery of or access to a vast array of interactive, multimedia educational programs, research and information data and services, and networking opportunities; (2) seeks to make such materials available to the public via public libraries, electronic databases and telecommunications systems such as the Internet and other networks. Authorizes the National Science Foundation, the Department of Education, the Department of Commerce, the Defense Advanced Research Projects Agency, and the Library of Congress to make multi-year grants to states to develop electronic libraries. Introduced on March 22, 1993. Referred to Senate Committee on Commerce, Science and Transportation.

Health Services

S. 1088 (Harkin)
Rural Telemedicine Development Act of 1993

A bill to amend the Public Health Service Act to provide grants for the development of rural telemedicine. Introduced on June 10, 1993. Referred to Senate Committee on Agriculture, Nutrition, and Forestry.

S. 1143 (Baucus)

A bill to improve the delivery of health care services in rural areas by creating an Assistant Secretary for Rural Health, to amend title XVIII of the Social Security Act to provide that medical assistance facilities be reimbursed based on reasonable cost, to establish a grant program for the use of interactive telecommunications systems, and to adjust the payments made for certain direct graduate medical education expenses. Introduced on June 22, 1993. Referred to Senate Committee on Finance.

Privacy and Intellectual Property

H.R. 12 (Hughes)

A bill to amend title 17, United States Code, with respect to infringement of copyright. Makes a television broadcast station an infringer of copyright and subject to civil remedies (including attorney’s fees and litigation costs) if such station, without the express written consent of the copyright owner, authorizes the secondary transmission by a cable system or other multichannel video programming distributor of a copyrighted work broadcast by such station. Introduced on January 5, 1993. Referred to House Committee on the Judiciary, Subcommittee on Intellectual Property and Judicial Administration.

H.R. 135 (Collins, C.)
Individual Privacy Protection Act of 1993

A bill to amend the privacy provisions of title 5, United States Code, to improve the protection of individuals information and to reestablish a permanent Privacy Protection Commission as an independent entity in the Federal Government.

Establishes an Individual Privacy Protection Board to: (1) study the data banks, automated data processing programs, and information systems of public and private organizations to determine standards and procedures in force for the protection of personal information; ... and (5) comment on the implications for data protection of proposed Federal, State, or local statutes, regulations, or procedures. Provides penalties for violations of privacy rights.

Introduced on January 5, 1993. Referred to House Committee on Government Operations, Subcommittee on Information, Justice, Transportation and Agriculture.

H.R. 759 (Boucher)
Compulsory License Clarification Act of 1993

A bill to amend chapter 1 of title 17, United States Code, to include in the definition of a cable system a facility which makes secondary transmissions by microwave or certain other technologies. Introduced on February 3, 1993. Referred to House Committee on the Judiciary, Subcommittee on Intellectual Property and Judicial Administration. Subcommittee hearings held on March 17, 1993.

H.R. 897 (Hughes)
Companion Measure - S. 373
Copyright Reform Act of 1993

A bill to amend title 17, United States Code, to modify certain recordation and registration requirements, to establish copyright arbitration royalty panels to replace the Copyright Royalty Tribunal. Introduced on February 16, 1993. Referred to House Committee on the Judiciary, Subcommittee on Intellectual Property and Judicial Administration. Subcommittee hearings held on March 3 and 4, 1993.

H.R. 1103 (Hughes)

A bill to amend title 17, United States Code, with respect to secondary transmissions of superstations and network stations for private home viewing, and with respect to cable systems. Introduced on February 24, 1993. Referred to House Committee on the Judiciary, Subcommittee on Intellectual Property and Judicial Administration. Subcommittee hearings held on March 17, 1993.

H.R. 2576 (Hughes)
Digital Performance Right in Sound Recording Act of 1993

A bill to amend title 17, United States Code to provide an exclusive right to perform sound recordings publicly by means of digital transmissions. Introduced on July 1, 1993. Referred to House Committee on the Judiciary, Subcommittee on Intellectual Property and Judical Administration.

S. 23 (Hatch)

A bill to amend title 17, United States Code, to clarify news reporting monitoring as a fair use exception to the exclusive rights of a copyright owner. Introduced on January 21, 1993. Referred to Senate Committee on the Judiciary, Subcommittee on Patents, Copyrights and Trademarks.

News Items from “The Computists’ Communique” 1992

- The U.S. prints 600M pages of computer printout each day, plus 234M photocopies, 76M letters, and 24M documents, or 45 sheets of paper per worker per day. Electronic document "imaging" is going to save a lot of trees. [Herbert A. Edelstein, Euclid Associates. Steve Kaplan, CC, 5/19.]

- ACM has contracted with Engineering Information Inc. (New York, NY) to fax you articles from 11 journals and 40 conference proceedings of the last 10 years. The document delivery service (EiDDS) also handles literature from

Elsevier, IEEE, Pergamon, John Wiley & Sons, and AAAI. For coverage and prices, contact Ruth Miller at (800) 221-1044 or (212) 705-7301, fax (212) 832-1857. [ACMemeberNet, 5/92.] You might also check your phone book or library for local document delivery services.

- McGraw-Hill Inc. (New York) is installing an Electrobook digital press that works like a laser printer -- at 350 feet/minute, printing both sides of a page. (Newspaper presses run at 2,000 feet/minute.) Initial use will be for McGraw-Hill's Primis line of custom textbooks. R.R. Donnelley is expected to install an Electrobook press for its Books on Demand Module in Harrisonburg, VA. [Patrick M. Reilly, WSJ, 4/14.]

- R.R. Donnelley (Chicago) and Compton's NewMedia, a San Diego- based Britannica company, are forming a partnership for CD ROM and digital publishing. Donnelley's Database Technology Services division (Willowbrook, IL) will handle all CD-ROM pre-production services for Compton's NewMedia, which has links with Merriam Webster, McGraw Hill, National Textbook Co., and others. One product is Compton's SmarTrieve Publishing Toolkit, which provides indexing and text search software for interactive books and reference sources to new electronic publishers. (708) 655-7705. [Business Wire, 3/11. agentsee.]

- The New Publishing: Technology's Impact on the Publishing Industry Over the Next Decade is a 62-page technical report by Gregory Rawlins. You can get a copy for $5 P&H if you write to ICDS, Indiana University, Lindley Hall, Bloomington, IN 47405. [Copler@iubacs.bitnet, PACS-L, 3/16.]

- Fortune magazine reports that 76% of subscribing managers use a computer at work, averaging 15 hours per week. A quarter of these are hooked into networks, mostly at large companies; many more (40%) are planning to add networked computers this year. More than half also use a computer at home, averaging 4.4 hours on work-related tasks. (Another 49% plan to buy desktop or portable PCs for home use next year.) Popular software programs are Lotus 1-2-3 and WordPerfect, followed by Harvard Graphics, dBase, Windows, and Excel. Only 20% of the offices have Macs available. [Robin Stacy, The Macon Telegraph, 3/11. agentsee.] The managers also plan to buy software, but I get the impression that they're not looking forward to the process. One of the nice things about Macs is that there's less to choose from -- and it's nearly all good to excellent. With a PC, you need a wizard around somewhere -- especially with Windows, which runs on top of DOS. Macs are easier, and you can use eight or ten programs with less trouble than learning DOS WordPerfect and Excel.

- The American Newspaper Publishers' Association seems to be losing its fight with the Bell companies due to fraternization. Member newspapers keep breaking ranks to use phone services in the delivery of their information services. This is partly a defense against the cable and microwave-based communication companies. [Dana Blankenhorn, Newsbytes, 3/19.]

- RELCOM Joint Stock Company has a network information department to spread science and technology news from the former Soviet Union. Publications include an RENEWS bulletin and a Computer Market monthly supplement to the POISK scientific newspaper. Contact Vladimir Shliemin (nev@renews.relcom.msk.su) to request RENEWS.

- ANS, the carrier of NSFnet backbone services, has reached a trial agreement with CIX, the Commercial Internet Exchange. Although ANS has not yet joined CIX, it agrees to share traffic in both directions. Physical implementation in 60 days will open a way for NEARNet, BARRnet, and other internet regionals to exchange commercial traffic with Alternet, PSI, and all other CIX members -- provided that certain ANS CO+RE agreements are signed (and paid for). [Mitchell Kapor (mkapor@eff.org), com- priv, 6/9.] NSF's Acceptable Use Policy can thus be bypassed at the backbone level, although local host policies would still apply.

- The Special Libraries Association is having its 83rd (!) annual conference this week. Master's-level library professionals and information analysts make about $45K. Most are computer-proficient, including word processing, spreadsheets, and databases. Apple has a library staff of 18, each with a high-end Mac and access to 600 databases, 750 magazines, and 8,000 books. Raychem's library handles 35 technical inquiries per day. Dialog Information Services (Menlo Park, CA) says there are over 4,500 commercial databases. (Search costs average about $100/hour.) [Gavin Power, SF Chronicle, 6/9.] (Sounds like a great market, although competition is keen and profit margins are slim.)

- There will be a shortage of MLS-level librarians well into the decade, especially in youth services, school librarianship, cataloging, and special librarianship (such as corporate libraries). People often enter librarianship as a second or third career. Retirements are up and enrollments are down. Salaries range from entry-level $20K to $100K for the director of a large library. [Jenny Upchurch, SJM, 6/14.] (Maybe AI techniques could help with cataloging.)

- Jack Kessler (kessler@ocf.berkeley.edu) says that the Tres Grande Bibliotheque (TGB) or Bibliotheque de France (BDF) project, with initial funding of US$1B , "easily ranks as the century's premier library project." One goal is to give the French people electronic access to hitherto secret treasures of the Bibliotheque Nationale. [PACS-L, 11/25/91.]

- The British Library has become the first overseas member of the Research Libraries Group, Inc. (Mountain View, CA). Harvard University is another new member. RLG priorities include preservation and on-line access to historic collections. [Jennifer Porro (bl.jmp@rlg.stanford.edu), LIBRES, 3/5.]

- The MARC standard for networked information is being coordinated by Sally H. McCallum (smcc@seq1.loc.gov), LM 639, Library of Congress, Washington, DC 20540. Two important papers are "Dictionary of Data Elements for On-line Information Resources" (MARBI 49, Spring '91) and "Providing Access to On-line Information Resources" (MARBI 54). Send a "get dp54 doc" to listserv@maine.maine.edu to retrieve the latter. [Barbara.Shipman @med@umich.edu, CNIDIR-L. David Mattison(dmattiso@cue.bc.ca), PACS-L, 4/23.]

- BRS has announced an AI-based Domain Independent Intelligent Information and Services Network Interface (DISNET) from IDE. The Unix or DOS interface negotiates an ASCII or GUI query, then uses BRS/SEARCH and RDBMS (Oracle, Ingress, etc.) software to access multiple local and remote databases. Videotex, email, and natural-language interfaces are under development. BRS Software Products Benelux, Gele Rijdersplein 16, 6811 AP Arnhem, the Netherlands; (+31) 85 579600. [MeckJournal, 3/92.]

- Charles W. Bailey, Jr., has examined "Intelligent Library Systems: AI Technology and Library Automation Systems" in Advances in Library Automation and Networking, 4(1991), pp. 1-23. He lists useful systems and reasons why there aren't more of them -- lack of AI training, tools, expertise, willingness to take risks -- then speculates on fruitful R&D areas. [Lis Rowlinson, Current Cites, 3/92.]

- Publishers, bookstores, and libraries are all intermediaries in getting information from authors to users. Publishers and bookstores make money; libraries do not. Perhaps libraries should cut out the middlemen, dealing with authors directly. [Sanjay Chadha (sanjay chadha@library.tmc.edu), PACS-L, 3/1.] Unfortunately, librarians wouldn't know how to make money even if authors contributed their works for free. It's more likely that publishers will bypass libraries by selling information services and CD ROMs.

- Terry Tobias (ttobia01@gumedlib.georgetown.edu) recommends two articles on the likelihood of on-line information retrieval displacing traditional journals in medicine: "BioSYNTHESis: Bridging the Information Gap," by Naomi C. Broering et al., Bull. Med. Libr. Assoc., 77(1), Jan. 1989, pp. 19-25; and "Medical Informatics: An Emerging Academic Discipline and Institutional Priority," by Robert A. Greenes, JAMA, Feb. 23, 1990, Vol 263 (8), pp. 1114-1120. [on-line, 3/20.]

- Several libraries report that they've saved money by canceling Chem/Bio Abstracts and subscribing to bibliographic search services like Dialog and STN. The arrangement does not endanger ACS accreditation. [John Piety (piety@jcvaxa) and Mark G.R. McManus (mmcmanus@s850.mwc.edu), PACS-L, 3/20.] Monthly costs aren't predictable, but they are predictably low.

- The ERIC indexing service is the first to abstract an electronic journal, New Horizons in Adult Education. The next issue of Serials review is introducing an Electronic Journal Forum and will discuss New Horizons and the problem of indexing e-journals. [Linda Langschied (langschied@zodiac.bitnet), PACS-L, 4/10.] The MLA Bibliography and Directory of Periodicals also cite e-journals. [Daniel Uchitelle (mlaod@cuvmb.bitnet), ibid.]

- The ERIC CIJE clearinghouses are poised to annotate and index electronic journal articles. Resources are limited, so e-journals must satisfy the usual criteria for substantiveness, contribution to knowledge, authority of author and source, timeliness, availability, etc. RIE archiving can help make copies available through microfiche collections or ERIC reproduction. [Nancy R. Preston (eric@suvm.acs.syr.edu), PACS-L, 4/20.]

- Project Gutenberg has the 1911 Roget's Thesaurus. Ed Vielmetti (emv@msen.com) has created an indexed version named roget-thesaurus on WAIS host wais.cic.net. [alt.wais, 12/11.] 1990 U.S. Census information is also available, along with the Oedipus Trilogy and Herland. Also corrected versions of the

King James' Bible and of Far From the Madding Crowd, and a new edition of Paradise Lost (plrabn10.txt). FTP at night from etext or etext92 on mrcnext.cso.uiuc.edu. Newsletter info is in directory etext/articles. Supporters of the project include Apple, Calera, TextPert, Caere, and Expervision. [Michael S. Hart (hart%vmd.cso.uiuc.edu), PACS-L, 2/20 and 4/20.]

- Meckler will be publishing a book (Fall, 1992) on text-management and bibliographic programs for DOS and the Mac. Systems include askSam, Pro-Cite Mac, WordCruncher, Inmagic, Papyrus, Library Master, EndNote, IZE, Notebook II, and Nota Bene. Contact Erwin Welsch (ewelsch@vms.macc.wisc.edu). [PACS-L, 10/1.]

- For a review of bibliographic software, see Health Libraries Review, 1991, V8, pp. 11-20. I believe the article is Diana Herman's "Downloading from Medline: A Comparison of Personal Database Software." It covers Papyrus, Bib/Search, DMS4CITE, Notebook II, Pro-Cite, Ref-11, Reference Manager, Refsys Super and the Ref-Filer. [Geoff Smith (ql23@liverpool.ac.uk), PACS-L, 10/2.] Another review of Papyrus, ProCite, and Reference Manager is in Appendix II of Sue Stigleman's "Bibliographic Formatting Software," published by the Institute for Academic Technology, UNC Chapel Hill (iat@unc.bitnet). [Jim Morgan (izie100@indyvax.bitnet), PACS-L, 10/2.]

- "Bibliography Formatting Software: A Buying Guide," by Sue Stigleman, can be found in Database 15(1), 2/92, pp. 15-27. The review includes Pro-Cite, Artfile, and Notebook. [Vivienne Roumani, Current Cites, 4/22.]

- Bibliographic programs let you format your citations using keywords (author, editor, etc.), then print them out in your choice of formats. Programs can import data from other sources, including downloads from Dialog, Medlars, and other on-line or CD-ROM services. (Conversion programs may cost extra.) Each citation can typically contain 32K characters or more. You can attach notes to any record, and can do Boolean searches on any field. The two Mac programs below work with most word processors, and can produce footnotes as well as bibliographies. Each supports only a single bibliographic database, with size limited to 32Mb or 100K records.

- EndNote Plus ($249/$149 street; Niles & Associates; (510) 655-6666) is good for quick and easy citation entry and formatting. It offers 14 reference types (book, journal, thesis, etc.). Common "rapid entry" abbreviations are permitted for journal fields. Importing can be done in Pro-Cite or Unix Refer/Bibix [Bibtex?] format. File conversions are via the EndLink program, which does not include several popular library formats. EndNote Plus will identify duplicate records but will not delete them automatically. A "quickfind" database indexing function is available, but doubles or trebles the size of your database. Document text can be in almost any format, including MacWrite II. You can copy citations text ([author, year record#]) from a database menu, making insertion very easy. The program will automatically reformat in-text citations and then insert your bibliography at the end of the document. You can have more than one document (or chapter) using the same database, with the bibliography being appended to the final document. You can also print out your entire database as a bibliography, but the capability is limited compared to Pro-Cite. [Aaron K. Poffenberger, BMUG Memo, 11/91.]

- Pro-Cite ($395/$195 street; Personal Bibliographic Software, Inc.; (313) 996-1590) is available in both Mac and DOS versions, and is good for advanced database work. It has 26 reference types, including dissertation, music, and movie. An "authority list" stores common abbreviations for use throughout the database. Only ASCII importing is supported. File conversions require a separate program for each on-line service or library format, and this can become quite expensive. Pro-Cite will delete or merge duplicate records, and has a global search-and-replace function. You can save commonly used search criteria in files. Document text must be in the original MacWrite format. Selecting citations from a database menu is a bit more complicated than in EndNote Plus, as a "punctuation file" must be defined. Browsing the database is more convenient in Pro-Cite, though. Pro-Cite produces a separate bibliography in MacWrite format. (If you don't like the [author, year record#] in-text citation format, you must edit it by hand.) It is particularly good at printing out a categorized bibliography of your entire database. [Ibid.]

- Frank Norman (f-norman@nimr.mrc.ac.uk) says that Papyrus is cheaper and easier to use than Procite, especially for import reformatting. It's a good package for individual scientists. Procite has more power as a general-purpose database manager. A new version of Procite will include italics, boldface, and subscripts. [PACS-L, 10/2.]

- Mark Zimmerman (science@oasys.dt.navy.mil) has some experimental information-retrieval source code that he's willing to share. qndxr.c builds inverted index files for large text files (at 50-80Mb/hour on Sun and NeXT workstations); brwsr.c is a command-line-driven browser program that lets you see word lists, keyword-in-context displays, and full text on demand, and does very simple proximity search. Todd Kaufmann of CMU has a GNU Emacs interface to the brwsr which makes it easier to use. Mark also has a Free Text 1.02 HyperCard/C interface to the indexed text files; it's 250Kb in binhex'd stuffit'd form. Mark recommends the PARA group (para-request@cs.cmu.edu) for discussion of hypertext, free-text IR, Emacs interfaces, etc. Liam Quin's lq-text Unix IR source code would be discussed there. [IRList, 4/25.]

- Senator Gore (D-TN) has entered a bill, The Information Infrastructure and Technology Act of 1992, that calls for NSF to connect K-12 schools to NSFNET and to sponsor educational software and teacher training ($300M/5 years); NIST to develop networking technology for manufacturing ($250M); NIH, NLM, and NSF to develop applications for health care ($300M); and NSF, NASA, and DARPA to develop digital libraries and databases ($300M). OSTP would coordinate the activities under the HPCC initiative. Gore's office is (202) 224-4944. [David J. Farber (farber@central.cis.upenn.edu), com-priv, 7/1.] Text of Gore's bill is available via FTP as gorebill.1992.txt in /nren/iita.1992 on nic.merit.edu. You can also mail a "send gorebill.1992.txt" message to nis-info@nic.merit.edu. [Mark Davis-Craig (mad@merit.edu), com-priv, 7/6.]

- Something is happening. Windham Hill sells music through the Nautilus multimedia magazine-on-disc service. It also bypasses record stores by shipping encrypted discs to potential purchasers. Justice Records has an electronic record store on CompuServe. Cable companies are selling 30-channel "digital radio" and pay-per-listen programs. Syracuse University has hundreds of thousands of digitized recordings ready for downloading. [Peter Newcomb, Forbes, 7/20.] Newsletter and e-journal publishers are bypassing traditional publishers. Ross Perot was bypassing political parties and the media establishment. Shareware bypasses software publishers. Adobe sells pay-as-you-need-them fonts on CD ROMs. Bypassing middlemen is an age-old route to wealth. (The A&P grocery chain, for instance, started as a straight-off- the-ship tea retailer. McDonalds in Russia brings in its own beef. 7-11 in Japan is bypassing traditional distributors.) What's new is that computers are putting producers in direct contact with customers. That lowers costs, encourages small businesses, and strengthens the producer-consumer relationship. It's bound to be good for the economy and for our standard of living.

- The Oxford English Dictionary (2nd ed.) is now available on CD ROM, and can be searched with software from AND Software (Rotterdam). The last of its 616,500 entries is Zyxt, an obsolete word meaning "see." (Its new meaning of "the last word in the OED" isn't listed. :-) [BW, 8/3.] Oxford University Press sold about 1K copies of a 12-floppy set in 1987. This $875 ROM edition has 40% more data (including 2.4M illustrative quotations and 249K etymologies) and much better search software. The $2,750 hardback version fills 20 volumes, takes four feet of shelf space, and weighs 137 pounds. [Steve Lohr, NYT. SJM, 7/26.]

- Lance Leventhal sent me a review copy of Ellen Thro's "The Artificial Intelligence Dictionary" (Microtrend Books, Slawson Communications, (619) 744-2299). Its 1,300 definitions cover topics in logic, expert systems, neural networks, fuzzy systems, etc., and seem aimed at writers for the trade press. The Yale Shooting Problem is present (although cryptic); the DAI problem of The Dining Philosophers is not. ROV (remotely operated vehicle) is present, ALV (autonomous land vehicle) is not. The appendices seem likewise a bit sparse and idiosyncratic. Under abbreviations, DARPA is listed but MCC is not. I'm not sure why one would want lists of common operators in Lisp, Prolog, and OPS5, or multilingual equivalents of computer terms. Ellen does give a nice list of addresses -- but no phone numbers -- for 15 professional organizations, 6 magazines, 47 journals, 19 newsletters, 8 compendia, and 17 recurring conferences. (No wonder we can't keep up!) One appendix mentions 25 landmark expert systems; another gives affiliations -- but not addresses -- of 90 prominent researchers. This is an interesting browsing book for someone who half knows the material (e.g., students), but seems only half there as a reference book.

- The CD-ROM Directory (TFPL Publishing, London; UK#81) is a 870-page compilation CD-ROM and multimedia publishers, distributors, 2,212 titles, and related publications -- indexed by title, subject, country, computer type, and software. $150 from Omnigraphics, (313) 961-1340. Also available in CD ROM. [John McCormick, Newsbytes, 3/10.]

- Newsbytes is a computer-related news service carrying over 600 original write-ups each month. You can get two email deliveries or one PC/Mac floppy disk per week for $25/month. (DOS users get front-end software for menu and keyword access.) Newsbytes News Network, 822 Arkansas Street, San Francisco, CA 94107; (415) 550-7334. One month free if you cancel. Usenet and BBS distributions are also available. Material for the articles is often culled from other news wires, but tends to be pretty good.

- "Discovering RLIN" is a 52-page booklet introducing the Research Libraries Information Network database for reference librarians and scholars. RLIN materials include journals, rare books, manuscripts, letters, photographs, films, sound recordings, computer files, incunables, and realia. Distribution Services Center, The Research Libraries Group, Inc., 1200 Villa Street, Mountain View, CA 94041-1100. [Jennifer Porro (bl.jmp@rlg.bitnet), IRLIST, 6/15.] I presume that the booklet is free.

- "Information Resource Guides: Technology Sources and Bibliographies" is available free from the Institute for Academic Technology, P.O. Box 12017, Research Triangle Park, NC 27709-2017; (919) 560-5031, (919) 560-5047 Fax. You can also request it from pubs.iat@mhs.unc.edu or from Carolyn M. Kotlas (carolynk.iat@mhs.unc.edu), or FTP it from gandalf.iat.unc.edu. Topics include CD ROM and Laserdisc sources, computer lab design, copyright guidelines, computers and the humanities, software for higher education, distance education, internet resources, multimedia developers and associations, and wide-area information servers. [CCNEWS, 6/19.]

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News Items from "Electronic Frountier Foundation (EFF) Library"

EFFector On-line July 29, 1992 Issue 3.1 / Part 1
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UPDATE ON THE EFF LIBRARY

The EFF Library was set up over a year ago when it became clear that, regardless of the digital revolution, we were being overwhelmed by a wave of hard copy. At that time, we had a backlog of around 1,000 documents, books and magazines concerning issues relevant to the Electronic Frontier. We engaged a professional librarian, Hae Young Wang, to bring order to chaos, and to provide us with a method that would enable us to file and retrieve material necessary to the work of the foundation.

Today, the EFF library in Cambridge houses over 2,300 items. The holdings cover journal articles, newspaper articles, conference proceedings, court documents, legislation, magazines, books, and brochures. The subject areas include such things as information infrastructure, computers and civil liberties, intellectual property and copyrights, and EFF archives.

The Library also maintains over 130 subscriptions to magazines and newsletters.

In addition, the EFF library maintains, classifies and indexes EFF's anonymous ftp archive files. These files, which are accessible to everyone with Internet access, have recently been re-organized into what we hope is a more user-friendly and informative manner. In the EFF ftp directory, you can find documents about the EFF, back issues of its on-line newsletter, notes on eff-issues, historical items, legal issues, current legislation, local chapters, and a host of other material germane to the Electronic Frontier.

While the ftp files are open to all, the EFF Library can now serve only the staff here and in Washington. We hope to be able to provide service to EFF members and the general public in the future, as funding and staffing allow.

In the meantime, we have recently acquired new scanning software which we hope will reduce the work involved in moving hard-copy information into digital form. With this in place we will be adding items to the anonymous ftp archive at an increased rate throughout the rest of the summer.

Recent additions to the EFF ftp files are:

The EFF Open Platform Proposal. This is the full text of the EFF's plan to create a national public network through the deployment of ISDN technology. (pub/EFF/papers/open-platform-proposal)

Howard Rhinegold's "A Slice of Life in My Virtual Community".

This meditation on what it means to be on-line in 1992 was first serialized in EFFector On-line.
(pub/EFF/papers/cyber/life-in-virtual-community)

Senator Al Gore's High-Tech Bill (S.2937) as introduced on July 1, 1992. This bill provides funding to both NSF and NASA to develop technology for "digital libraries", huge data bases that store text, imagery, video, and sound and are accessible over computer networks like NSFNET. The bill also funds development of prototype "digital libraries" around the country. This is the full-text of this bill along with the press release from Gore's office announcing the bill.
(pub/EFF/legislation/gore-bill-1992)

An information packet on the GPO/WINDO legislation before congress as S.2813/H.R. 2772. This discusses the function of the proposed "gateway" for on-line public access to government databases. From the Taxpayers Assets Project.
(pub/EFF/legislation/gpo-windo-info)

These files are also available through WAIS as eff-documents.src. WAIS clients are available for the Mac, PC, NeXT, X11, and GNU Emacs environments via anonymous ftp from think.com. A "guest" WAIS client is available by telnetting to quake.think.com and logging in as 'wais'.

To retrieve these files via email, send mail to archive-server@eff.org, containing (in the body of the message) the command

send eff <path from pub/EFF>

So to get the Gore bill, you would send

send eff legislation/gore-bill-1992

If you have any trouble obtaining these documents, send email to ftphelp@eff.org.

EFFector On-line 5.07
Summary of Rep. Boucher’s Bill for NREN applications
Keywords: NREN,Boucher

Date: 30 Apr 93 20:13:12 GMT

In this issue:
Congressman Boucher Introduces NREN Applications Bill

"Future of Computing" Program in Palo Alto, CA
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Congressman Boucher Introduces NREN Applications Bill

--Offers greatly expanded vision of applications program
for widespread social benefit

by Andrew Blau
EFF Associate for Telecommunications Policy

On April 21, Congressman Rick Boucher (D-VA) introduced legislation to create computer and networking applications to serve the education, library, and health care communities, and to promote access to government information. The bill, H.R. 1757, significantly expands on similar provisions found in last year's "Information Infrastructure and Technology Act" (often referred to as "Gore II," then-Senator Gore's follow-up to his NREN bill, the High Performance Computing Act ("HPCA")), and the Senate bill to promote U.S. competitiveness, S. 4.

Boucher, who chairs the House Science Subcommittee which oversees the NSF, has held oversight hearings on the development of the NREN program at which EFF Chairman Mitch Kapor testified. Many of EFF's suggestions, and the suggestions of EFF's partners in the education, library, and health care sectors, have been included in this legislation.

Highlights include:
*a substantial broadening of the focus of NREN to accelerate progress toward "a universally accessible high-capacity and high speed data network for the nation";

*a significant commitment to public libraries, K-12 schools, and support for hardware purchases;

*the creation and inclusion of local 'civic networks' of local libraries, schools, and local and state government offices, which would be connected to the Internet;

*an emphasis on promoting access to government information; and

*a codification of the distinction between research and production networks.

This bill also shifts away from the manufacturing focus of the earlier bills; it has no provisions for manufacturing applications at all.

There are a handful of weak spots, most notably that the bill seems to emphasize broadband connections to the Internet, which EFF believes could drive up the costs of the connections program and reduce the number of beneficiaries; and the lack of any coordinating or responsible agency for the government information program, the network security program, the privacy program or the ease of use program.

EFF supports the approach outlined in this bill, and will be working to secure passage of it. We will also seek some minor modifications in order to improve the bill at the margins -- for example, to improve the access to information section in order to support putting federal information on-line and enabling innovative non-profit groups to make it available as demonstration projects, and to clarify that the broadband provisions are an option, not a mandate. Overall, however, EFF believes this is a substantive advance that merits widespread discussion and support.

EFF will make a copy of the full text of the bill in our ftp archives (ftp.eff.org).

Section-by-section review:
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Sections 1 and 2 include the bill's title ("High Performance Computing and High Speed Networking Applications Act of 1993") and the Congressional findings that support the need for this legislation.

Sec. 3. Applications of the High Performance Computing Program. Contains the major provisions, which are proposed as an amendment to the original HPCA. Sections 301 through 305 cover administrative issues.

Sec. 301 establishes the applications program. The bill improves on S. 4 by specifying that the applications should be "designed to be accessible and usable by all persons in the United States"; adds the provision of government information to the program purposes, and mandates that the Plan to create applications must take into account the recommendations of the High Performance Computing Advisory Committee, which this bill also mandates will include representatives of the research, K-12, higher education, and library communities, consumer and public interest groups, network providers, and the computer, telecommunications and information industries.

Sec. 302 describes the Plan to implement the program. The Plan must: (a) be submitted within one year and revised at least once every two years; (b) include goals and priorities, specific responsibilities of agencies and departments to meet goals, recommend funding levels to departments; and (c) include progress reports, evaluations and recommendations.

Sec. 303 describes the role of the Federal Coordinating Committee for Science, Engineering, and Technology (FCCSET) for coordination among agencies and budget review.

Sec. 304 creates a new “Coordinator” position, which is to be chosen from the staff of the White House Office of Science and Technology Policy. The Coordinator is to monitor the agencies, report any discrepancies to the OSTP Director, assist in interagency coordination, and act as Congressional and public liaison.

Sec. 305 describes the annual reports that each agency is to submit to OMB and OMB’s review and report to the President.

The major application areas:
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Sec. 306 creates a program to foster network access. This is a new provision to create local networks of K-12 schools, libraries, state and local governments, etc. It includes support for buying hardware and connecting those local nets to the Internet; it also expands training to teachers, students, librarians, government personnel to use networks and the Internet. Note however, that the provisions specify broadband connections, which could slow down the program, increase the costs, and reduce the beneficiaries if institutions are not free to choose the most appropriate-sized connection for their needs. NSF is the lead agency. Over the next five years, it authorizes 20, 60, 70, 80 and 80 million dollars (i.e., $310 million). Sec. 307 calls for research into security and privacy of information, integrity of digital information, and ease of use for non specialists. This is also a new provision with no counterpart in S. 4. It authorizes 10, 30, 35, 38, and 38 million dollars over the next five years for these activities (i.e., $151 million). No lead agency is specified.

Sec. 308 outlines educational applications. H.R. 1757 broadens the range of educational applications compared to S. 4, and adds additional features to support the intent of this section. New provisions include: support for hardware and software

purchases in order to demonstrate the educational value of the Internet; support for systems, software and networks for "informal education" including job training and life-long learning applications outside of school; a mandate to address the needs of rural and urban communities; a clearinghouse of K-12 network projects and available educational resources; and the creation of undergraduate level
course materials for student teachers to familiarize them with the Internet and educational uses of computer and networking applications. Other elements are similar to or better specified versions of provisions found in S. 4 that call for projects to enable K-12 students and teachers to communicate with peers and university level students and teachers, and to gain access to educational materials and other computing resources. NSF is directed to be the lead agency, and the section authorizes 24, 70, 82, 94 and 94 million dollars over the next five years ($364 million) for education.

Sec. 309 outlines health care applications. This is a substantially expanded version of S. 4's health care section. The lead agency is shifted from the National Library of Medicine to the Department of Health and Human Services, which is to implement it through the NLM, the National Institutes of Health, and the Centers for Disease Control. H.R. 1757 also splits health care applications into three subsections. Besides clinical information systems, which repeats S. 4's six health care provisions for clinicians, H.R. 1757 adds two sections of entirely new provisions: health information to public, and health delivery systems and population data sets for epidemiology. The section authorizes 24, 70, 82, 94, and 94 million dollars ($364 million) over the next five years.

Applications for health information to the public include: consumer-oriented, interactive, multimedia materials for health promotion and distribution of such materials to public access points, such as community health and human service agencies, schools and public libraries; interactive, multimedia materials to assist patients in deciding among health care options; interfaces to allow non specialists ease of access and use; and the means to provide customized preventative and treatment information to non specialists.

Applications for health delivery systems and population data sets include: networks and software for communication among local public and private health and human service providers, e.g., health centers, clinics, entitlement offices, and school based clinics to enable social service providers to deliver coordinated services; access for health care providers to current clinic-based health promotion and disease prevention recommendations and two-way links with prevention specialists at state and local health departments; and database technologies to help clinicians diagnose, treat, and provide preventative information to patients and facilitate the gathering of systematic population data sets in order to measure treatments and national health trends.

Sec. 310 describes the applications programs for libraries. Most of this section describes the same digital library applications found in S. 4: terabit storage systems accessible by thousands of simultaneous users; high speed digitizing of printed and photographic materials; tools to search huge volumes of stored text, imagery, data and sound; encouragement of the development and adoption of standards; smart systems to categorize and organize information; training for librarians and database users; making networked databases easy to use; and visualization tools to help browse through large volumes of imagery. The subsection on the development of prototypes, however, is expanded in three significant ways. H.R. 1757 specifies that the prototypes should be testbeds for all the features noted above. Most importantly, H.R. 1757 specifies that the prototype libraries will be accessible to the public via the Internet. Lastly, H.R. 1757 requests an evaluation of the suitability and utility of distributing electronic information over the Internet, including an assessment of the barriers that hinder the use of the Internet for this purpose. H.R. 1757 also directs NASA to develop databases of remote-sensing images to be made available over computer networks. NSF is named as the lead agency, and 10, 30, 35, 44, and 44 million dollars ($163 million) is authorized over five years. For its part, NASA is authorized 6, 16, 20, 20, and 20 million dollars ($82 million) for the same period.

Sec. 311 calls for applications for government information. H.R. 1757 has a set of new provisions to promote public access to information generated by Federal, state and local governments. H.R. 1757 calls for projects that connect depository libraries and other sources of government information to the Internet to enable access to Federal, state and local government information, and access to “related resources” as well as linkages among libraries in order to enhance the use of that information. H.R. 1757 also calls for the creation of technologies to increase access to and effective use of government information in support of three goals: research and education; economic development; and an informed citizenry. Finally, the section mandates the creation of a Federal information locator to help the public find and retrieve government information. No agency is given coordinating or lead responsibilities, but the bill authorizes 8, 24, 26 30 and 30 million dollars over the next five years ($118 million).

Other provisions:
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Section 4 changes the High Performance Computing Advisory Committee into a Computing *and Applications* Advisory Committee. It also adds representatives from K-12, consumer and public interest groups, and computer,

telecommunications, and information industries. Among the Committee responsibilities is to assess whether the applications that are developed successfully address the needs of the targeted populations and to estimate the number of users served by the applications.

Section 5 rewrites Section 102 of the HPCA. Whereas HPCA proposed that portions of the NREN would reach gigabit transmission rates "to the extent technically feasible," this bill appears to assume gigabit networking and moves on to redefine test-bed networks separately. The Network Program now would have three parts: R&D to support gigabit transmission speeds; experimental test-bed networks to develop advanced networking technologies in the quest for gigabit networks and to support applications that exceed what commercial networks can handle; and a connections program to help researchers, educators and students obtain access to and use of the Internet.

H.R. 1757 adds a new section to the HPCA, 102(d), that would codify the distinction between experimental, "bleeding-edge" research networks and services available off-the-shelf from commercial service providers. The bill specifies that eighteen months after the bill is enacted, test bed networks are forbidden to provide services that could otherwise be provided satisfactorily over commercial networks.

Other sections include one that creates a new OSTP Associate Director to oversee Federal efforts to disseminate scientific and technical information, and a handful of miscellaneous provisions.

Program Announcement for Palo Alto, California from Ted Haynes of the Churchill Club

Terry Winograd and Jim Warren will speak on "The Future of Computing and Its Impact on Society", May 27, 1993, at the Hyatt Rickey's, Palo Alto, California; sponsored by the Churchill Club (415-321-9016). A reception and a light dinner begin at 6:00 PM with the program starting at 6:45 PM.

Terry Winograd is a Professor of Computer Science at Stanford and a founder of Computer Professionals for Social Responsibility. Jim Warren is a MicroTimes columnist, founder of Infoworld, and a founder of the Computers, Freedom and Privacy Conferences. They will be joined by Denny Brown, founder of Coherent Thought and President of Expert Support.

Will more powerful computers turn into twenty-first century servants or Big Brother? What are the implications for employment, economic growth, privacy, education, and the family? Come and find out!

The Churchill Club, founded in 1985, is a non-profit public affairs organization in Silicon Valley that provides a non-partisan forum on timely issues. Past speakers include Edward Teller, Bill Joy, Bill Clinton and Sandra Kurtzig. The club has 1100 members of which about 66% work in a “high tech” related company.

News Items from ALAWON

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NREN Applications Bill Summarized

HR 1757 WOULD ESTABLISH NREN PROGRAM

On April 21, Rep. Rick Boucher (D-VA) introduced HR 1757, the High Performance Computing and High Speed Networking Applications Act of 1993. The bill amends Section 102 of the High-Performance Computing Act of 1991, which defined the National Research and Education Network. Under HR 1757, the NREN Program would have three components: (1) research and development of gigabit networking software and hardware; (2) experimental test bed networks for developing and demonstrating gigabit networking technologies and providing connections requiring network performance not available from privately operated commercial networks; and (3) support for researchers, educators, and students to obtain access to and use of the Internet for communications with others in the research and education communities and to allow for access to high-performance computing systems, electronic information resources, other research facilities, and libraries.

Federal agencies involved must have a plan for providing financial assistance to educational institutions, public libraries and others to enable them to access the Internet. Test bed networks are not to be used "to provide services that could otherwise be provided satisfactorily using privately operated commercial networks" after 18 months from enactment of the bill. The Internet is defined as "the network of both Federal and non-Federal interoperable packet-switched data networks."

ACCESS, TRAINING, AND RESEARCH

HR 1757 would also amend the HPCA by adding a new title III for applications of computing and networking. This title would require the Director of the Office of Science and Technology Policy to establish the Applications Program, including a plan and responsibilities of the Federal Coordinating Council for Science, Engineering, and Technology, as well as designating a coordinator at OSTP for the Program.

A section on network access would authorize a Connections Program at the National Science Foundation for creation of local networks in communities. The networks would connect institutions of higher education, elementary and secondary schools, libraries, and state and local governments to each other and to the Internet. The section also calls for programs to train teachers, students, librarians and government personnel. "Training programs for librarians shall be designed to provide skills and training materials needed by librarians to instruct the public in the use of hardware and software for accessing and using computer networks and the Internet."

Reports are required within a year of enactment on the extent to which the education, library, and state and local government communities have access to the Internet, broadband connections to the Internet, the factors limiting access, an estimate of the cost of providing universal broadband access for those institutions, and recommendations for collaborative public-private sector programs to expand connectivity. Authorizations: FY94 $20M, FY95 $60M, FY96 $70M, FY97 $80M, FY98 $80M.

A section on research in support of applications requires the plan to specify research in areas such as computer science and engineering, math, computer visualization, and human cognition needed to achieve the plan, plus research needs in network security and privacy, and ease of Internet use. Authorizations: FY94 $10M, FY95 $30M, FY96 $35M, FY97 $38M, FY98 $38M.

APPLICATIONS IN K-12, LIBRARIES, GOVT. INFORMATION

Applications for education would authorize NSF to develop and apply computing and networking technologies at all levels of education. K-12 is specifically identified for connections, acquisition of hardware and software, dissemination of information about use of computing and network technologies, development of courses and training, and development of education software. Authorizations: FY94 $24M, FY95 $70M, FY96 $94M, FY97 $94M, FY98 $94M.

Applications for health care would authorize the Department of Health and Human Services, through the National Library of Medicine and other HHS agencies, to focus on clinical information systems (including test bed networks for linking hospitals, medical libraries and other locations, as well as database technology for medical information and literature); health information for the public (including distribution to public access points such as public libraries); and health delivery systems and population data sets. Authorizations: FY94 $24M, FY95 $70M, FY96 $82M, FY97 $94M, FY98 $94M.

Applications for libraries would authorize NSF to support development of digital libraries and prototypes, including advanced data storage systems, advanced digitizing techniques, development of database software, development of standards, visualization methods, user-friendly tools, and training. Authorizations: FY94 $10M, FY95 $30M, FY96 $35, FY97 $44M, FY98 $44M. NASA would be authorized to develop databases of remote-sensing images. Authorizations: FY94 $6M, FY95 $16M, FY96 $20M, FY97 $20M, FY98 $20M.

Applications for government information would authorize unnamed agencies to support connecting depository libraries and other sources of government information to the Internet for access to federal, state, or local government information and related resources, and to support linkages with other libraries and institutions to enhance use of government information. Agencies could also support demonstration projects for improved public access to government information. This section includes establishment of a federal information locator system accessible over the Internet. Authorizations: FY94 $8M, FY95 $24M, FY96 $26M, FY97

$30M, FY98 $30M.

The bill also adds a high-performance computing and applications advisory committee with widely representative non-federal membership, including the elementary and secondary education, higher education, and library communities.

HR 1757 WOULD MAKE NREN A TRUE PROGRAM

The strength of HR 1757 is that it would implement the NREN Program as originally envisioned in the HPCA, adding substantive provisions for school and library connections and support for applications and training in areas useful to these institutions and the public. A welcome section on government information applications includes many of the provisions suggested by ALA. The science agencies to which funds would be authorized are those within the jurisdiction of the Science Subcommittee, but these agencies, particularly NSF, are to work in cooperation with other appropriate agencies.

The troublesome provisions relate to an artificial distinction between experimental test bed networks and production uses of networks, with a rigid 18-month timetable for such separation. These provisions reflect attempts to accommodate the telecommunications companies who recently produced a policy statement identifying their interest in network and national information infrastructure issues. However, the provisions would potentially affect the current structure of backbone and regional networks which are operated on top of private-sector communications facilities (which receive revenue for transport), but add services, training, and applications support which are not provided by the large communications companies.

Hearings Held on Boucher Networking Applications Bill

ADMINISTRATION VIEWS

Chairman Rick Boucher (D-VA) presided at hearings on his bill, the High Performance Computing and High Speed Networking Applications Act (HR 1757) on April 27 and May 6, 1993. The first hearing opened with John Gibbons, Director of the Office of Science and Technology Policy, providing the Administration's view. He discussed the Clinton Technology Initiative, of which the High Performance Computing and Communications Program is a critical part. The HPCC program has five components in the Administration's FY94 budget: (1) High

Performance Computing Systems, (2) National Research and Education Network, (3) Advanced Software Technology and Algorithms, (4) Basic Research and Human Resources, and (5) Information Infrastructure Technology and Applications.

Gibbons said HR 1757 is "important, forward-looking legislation and is largely consistent with the Administration's proposal for developing the nation's information infrastructure," including "very important provisions for improving the dissemination of Federal information." He felt roles for other federal agencies were needed, and he said the experimental/production distinction and the 18-month timetable could limit agency flexibility and complicate the difficult tasks of spurring private sector development and assisting the research and education communities.

INDUSTRY VIEWS

A panel of industry witnesses, Thomas Tauke of NYNEX, Robert Ewald of Cray Research (representing the Computer Systems Policy Project), W. B. Barker of BBN Communications, and Richard Rashid of Microsoft Corporation, were generally supportive of the bill. However, Tauke felt the restrictions in the bill in not allowing general ("production") use of federally subsidized test bed networks should extend to other areas of the bill as well. For instance, Tauke did not think the federal government should encourage development of local networks, nor did he see why schools and libraries would want to be connected to each other in local networks.

In the question and answer session, Boucher attempted to get general agreement from the panel on his vision of the government role which he saw as funding for new network technology research and development, support for applications such as those in the bill, creation of a test bed to develop technologies created through government R&D, stimulating setting of common standards and protocols, and helping institutions such as schools and libraries to get connected. The main disagreement was not over whether schools and libraries should be helped, but over how they should be helped. Tauke said local schools and libraries should be helped by providing government funding to them to purchase commercial services. He felt educational or other government supported networks might market their excess communications capacity. He admitted commercial providers do not always offer comparable services to Internet data communications at comparable prices, but said this was a regulatory problem that Congress should remedy. Barker's view was that government should support school and library connections by procuring them in the most economical manner, not by dictating one manner independent of costs.

APPLICATIONS AREAS - SCHOOLS, LIBRARIES

On May 6, the Science Subcommittee heard from several groups representing users of networks and applications. First to testify was Rep. Major Owens (D-NY), who stressed that barrier-free access to information was critical for all Americans, including people in urban and rural areas, people with disabilities, minorities, and the poor. He recommended that the bill "recognize public libraries as central to a free and comprehensive information delivery system available to everyone."

Don Detmer, Vice President for Health Services, University of Virginia, discussed the implications of high speed networking for health care. Connie Stout, Director of the Texas Educational Network, described the TENET system, a state-supported school network with 21,000 users. TENET was successful, she said, because it was simple to use and training was easily available. She also noted the specific difficulties in procuring equivalent services (connection to the network, training, etc.) from the commercial environment.

John Masten, Chief Operating Officer of the New York Public Library, commended the committee for including library applications, for the bill's focus on training, and for support of public libraries as network points of access. He emphasized that libraries of various types have a role in all program components of the bill. The NYPL experience in local and statewide cooperative efforts to increase access to electronic information, including a menu driven Internet gateway, involvement in creating and distributing a simple access kit for small libraries and schools, and close work with the New York State Internet Access Network (NYSERNET), made the library a believer in using local and regional network to reach the real needs of users.

Martin Massengale, President of the University of Nebraska, represented the National Association of State Universities and Land-Grant Colleges. Massengale made several points supported by ALA, EDUCOM, and others. He said he understood there were concerns that government-supported networking activities would interfere with commercial networks, and that the Internet was something separate from the public switched network. In actuality, he said, they all work together; "telephone lines connecting the campuses to the mid-level networks and the mid-level connections to the NSFnet are leased from regional, local telephone companies and interexchange carriers."

While strongly supporting most of HR 1757, Massengale expressed concern over the rigid timetable in Section 5 for change in the current structure for Internet support. Any transition from government support of networks to serve public missions should take into account performance based tests such as price, accessibility, breadth of service, competitive options, availability, ubiquity, and timing. Without such considerations, the bill's language may unnecessarily restrict federal and state government actions in the public interest.

INFORMATION INDUSTRY VIEWS

Cynthia Braddon, Vice President of McGraw-Hill, presented testimony for the Information Industry Association. She said the value of information content was missing from the bill. She recommended that development and implementation of a mechanism for compensating copyright proprietors be added to the list of digital library applications. IIA recommendations for government information applications included designating a lead agency, reflecting the essential role of the industry in enabling public access to information held by the government, and requiring determination of the competitive impact on other sources of information of any government agency initiatives.

Boucher asked the panel if the bill identified all the applications that needed to be supported. Stout replied that the education community hasn't had access, so it is hard for them to identify needed applications. Many schools do not have the hardware or the phone lines for electronic networking: an average elementary school has two phone lines; a junior high school has three, and a high school has six. Training is another need; 65% of TENET's budget is spent on training. Other witnesses also stressed the need for training.

A third hearing on HR 1757 is planned for Tuesday, May 11 (see below).

Upcoming Hearings

The following hearings were announced in the Congressional Record of May 7, 1993. Locations, dates, and times are subject to change.

HOUSE COMMITTEE ON APPROPRIATIONS, Subcommittee on Interior. Public witnesses for National Endowment for the Arts, National Endowment for the Humanities, and the Institute of Museum Services. Wednesday, May 12, 9:30 am and 1:30 pm, 2360 Rayburn.

HOUSE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY, Subcommittee on Science. Continuing hearings on HR 1757, the High Performance Computing and High Speed Networking Applications Act of 1993. Tuesday, May 11, 9:00 am, 2318 Rayburn.

JOINT COMMITTEE ON PRINTING. Hearing to review Congressional printing and other activities of the Government Printing Office. Tuesday, May 11, 9:30, SR-301.

About ALAWON:

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Other News Items and Announcements

ALCTS Announces Publication of "After the Electronic Revolution, Will You Be the First To Go?

ALCTS announces the publication of AFTER THE ELECTRONIC REVOLUTION, WILL YOU BE THE FIRST TO GO?, the proceedings of the 1992 Association for Library Collections & Technical Services President's Program held on 29 June 1992 at the American Library Association Annual Conference in San Francisco, CA. The editor of the publication and 1991-1992 President of ALCTS is Arnold Hirshon, University Librarian at Wright State University in Dayton Ohio.

The idea for the program was inspired by the pioneering work of those who have spoken and written about paradigm shifts, such as Thomas Kuhn and Joel Barker. Kuhn spoke about paradigm shifts in the scientific community, and Barker applied those observations to the world of management. Barker instructs us that when a paradigm shifts, our past success will guarantee nothing -- “When the paradigm shift occurs, everyone goes back to zero.” The electronic revolution currently occurring in libraries is such a paradigm shift.

In his introductory chapters, on “The Convergence of Publishing and Bibliographic Access,” Hirshon provides the general perspective for the proceedings and sets forth a general premise that the information access is moving from an indirect two-stage process of searching-then-retrieving information to a direct process where the search of the index and the delivery of information is done virtually at the same time.

The keynote speaker, Theodor Holm Nelson, coined both the term and the concept of hypertext over 25 years ago. Today he is actively engaged in Project Xanadu, a developmental project that seeks to create a world-wide electronic publishing network. In Nelson’s presentation “You the Guardians of Literature Still,” he addresses the changes in electronic communication and observes that the system of literature of which librarians have been the guardians is undergoing a paradigm shift. Nelson asserts that we are moving from a system of providing whole documents to one where the user purchases only separate pieces, with the quoted material bought from the publisher at the moment of request and with automatic royalty payment to the author.

Peter S. Graham (Associate University Librarian for Technical and Networked Services at Rutgers, The State University of New Jersey) writes about “Intellectual Preservation in the Electronic Environment.” Addressing the technical services perspective of libraries, Graham speaks particularly to the preservation of electronic information, and explores the implications to the profession when electronic texts remove the confidence that we have had in the past in the fixity of text in the print world.

Thomas Duncan (Faculty Assistant for the Museum Informatics Project and Associate Professor of Integrative Biology at the University of California at Berkeley) writes on the “Implementation of Electronic Information Systems in Universities and the Implications for Change in Scholarly Research.” Writing from the perspective of an informed user, Duncan notes that university faculty must develop a new structure for using electronic information, and this will have a serious impact on future research, teaching, and public service in universities.

Susan K. Martin (University Librarian, Georgetown University) in "Librarians on a Tightrope: Getting from Here to There and Loosening Up in the Process," provides a public services administrator's perspective. Explicating the Council for Library Resources funded "Strategic Visions Statement," Martin notes that if librarianship is to assume responsibility for molding the information environment, we must take steps to reinforce and emphasize our leadership role, which is now minimal or nonexistent.

These proceedings challenge all librarians to be electronic revolutionaries. The 1992 ALCTS President's Program was the first of two President's Programs to address the effects of electronic publishing on libraries. The second program will occur at the 1993 ALA Annual Conference. This 1992 program included a distinguished panel of individuals whose role was not to provide answers, but rather to raise questions about where information access is going both outside of librarianship and within it. It is up the reader to decide whether after the electronic revolution, will you be the first to go?

To order AFTER THE ELECTRONIC REVOLUTION, WILL YOU BE THE FIRST TO GO?" (ISBN 0-8389-7650-6), please contact the ALA Order Department, 50 East Huron St., Chicago, IL 60611; telephone 800-545-2433, press 7.

Clinton OKs Computer Access To Congressional Record, Federal Register

WASHINGTON (AP) _ The Congressional Record and the Federal Register, major sources of information about Congress and federal agency rules, will be made available through computers under a bill signed Tuesday by President Clinton.

The measure directs the Government Printing Office to establish a system for electronic dissemination of the material. A statement by Clinton said the system ‘‘will complement, not supplant, commercial information services and federal agency information dissemination programs.’’

AP-DS-06-08-93 1907EDT

Counterpoint Publishing and The Internet Company, (Internet.COM) announce

Gopher and WAIS Access to the Federal Register via the Global Internet

March 1, 1993

Introduction

The full text of the U. S. Federal Register is now available on the Global Internet via Gopher and WAIS. Anyone with a direct connection to the Internet can now browse, search and retrieve the full text of any article printed in the Federal Register. Articles appear the same day that the GPO makes them available in electronic format.

Methods of Access

The Internet Federal Register is available to any Internet connected host. There are three access methods which require a "client program" to run on your computer. All client programs mentioned are available free of charge to any Internet connected site, via FTP from various archives. The final access method requires only that you run the standard "TELNET" client on your computer. All TCP/IP packages available for popular computers support TELNET.

Gopher Access

Gopher is a "user-friendly" menuing interface to information, developed by the University of Minnesota. To access a Gopher server on the Internet, you run a client program on an Internet connected host. Clients are available for VAX/VMS, VM/CMS, MS-DOS, and Macintosh computers.

Gopher also integrates WAIS within itself, so using your single Gopher client program you can conduct WAIS searches, as well.

WAIS Access

WAIS (Wide Area Information Server) is a power search and retrieval engine developed by Brewster Kahle, (then of The Thinking Machines Company). WAIS support "relevance feedback searching" which allows a user to specify their search parameters not only as keywords, but to refine the search to favor documents or articles which are "like" a particular document. To access WAIS, you run a client program on an Internet accessable host. Clients are available for most popular computers.

NNTP (Usenet News) Access

NNTP is the standard way that news articles are transferred over the Global Internet. The Federal Register/NNTP Service breaks the Federal Register out into +/- 18 separate newsgroups in categories like:

argiculture
commerce
defense
education
energy
environ
finance
foreign
govern
health
humanserv
legal
science
transport
misc

Federal Register/NNTP Service allows you to keep the entire text of the Federal Register on-line, browsable using any standard Usenet newsreader.

TELNET Access

If you are unable to use Gopher/WAIS locally on your computer, or do not wish to contract for the multiple user pricing, access to a Gopher/WAIS "TELNET" account is also provided. This account will allow you to use Gopher and WAIS without having to run the client locally on your computer. The only requirement is that your computer support the standard Internet "TELNET" terminal access program.

Pricing

Gopher/WAIS Server Access

Gopher/WAIS pricing is measured by the number of regular users on your site who will have access to the Federal Register. Prices are yearly. Access to this service can be limited by Internet host or domain address. Domain address limiting allows an entire Internet domain, (eg. *.purdue.edu) to access this service.

Limitations

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'Library of the Future' Takes Shape at Columbia University Law Library

New York City, February 1, 1993..........Today, amidst the nation's third largest collection of legal materials, teeming with well over 700,000 volumes and a half-million sheets of microfilm, Columbia Law School publicly launched the nation's first 'virtual' library by announcing the installation of the world's leading parallel supercomputing system, the Connection Machine System, CM-2*, from Thinking Machines Corporation of Cambridge, Massachusetts. The 'virtual' library is part of Columbia's Project JANUS, a 5 year project aimed at making the University's vast resources more available to its students and researchers by allowing researchers to use electronic retrieval of complete text with unaltered format and graphics instead of less sophisticated text-only electronic sources or the traditional paper-based library system. Recent advances in the conversion and storage of full-text page images digitally are being coupled with a powerful new generation of search software on the CM-2 supercomputer developed by scientists at Thinking Machines.

"Columbia's system will include easy-to-learn, easy-to-use interfaces, more effective search methods, and the ability to make scattered text databases appear to be a single database. All these are important advances.

"Our goal is to create a library which is completely free-text searchable," said Willem Scholten, Columbia's Director of Computer Systems and Research.

"The library must allow users to 'browse' comfortably through the library environment, while also providing enhanced ability to locate a particular piece of information."

According to Scholten, free-text searches using natural language queries are more useful and accurate than keyword searches. A free-text system does not require users to have prior knowledge of the discipline they are searching and allows users to search the full text of documents for arbitrary combinations of words. Keyword systems require that indexers read all documents and assign each one keywords from a controlled vocabulary, a process is which is laborious, as well as imprecise and inconsistent.

With the JANUS system, for example, a researcher of free-trade agreements typing in "lowering US automobile production costs" would receive within seconds dozens of references. References would be listed in descending order based on how closely the text matches the typed in request. The system uses a complex weighing algorithm that focuses on uncommon words to direct the search.

A researcher could proceed to retrieve in seconds an optically exact text of a page or document, highlighting a paragraph that describes how the auto industry cut production costs, and request an additional search of texts matching that paragraph. The system would again in seconds list references in descending order based on how closely the text relates to the highlighted paragraph. The researcher could then download or print the documents -- or could continue on an even narrower search based on the new information.

Key to Project JANUS is that complete works with text, format, illustrations and graphics are digitally stored and electronically searchable. At Columbia, books and documents are scanned using an optical character recognition scanner both to produce a digital text file in which any word or phrase can be recognized by the computer and used by the search software and to produce a high definition optical image file which is an exact copy of the document seen by the user.

As the project progresses, Columbia will work with publishers to receive copyrighted materials directly in electronic form and to develop programs to track and verify the use of licensed materials electronically to comply with copyright laws. The project will also work towards establishing standard formats for scanned materials and making the system available nationally.

Thinking Machines Corporation is the world's largest manufacturer of highly parallel supercomputers. The CM-2, installed at the Columbia Law Library, is equipped with 32,000 processors and has 256 megabytes of main memory and 20 gigabytes (billions of bytes) of hard disk storage.

The Columbia Law School Library is the nation's third largest collection of legal materials, with over 700,000 volumes and over 500,000 microform items.

The collections cover the law in all its forms and for every country, and include the Toshiba Library for Japanese Legal Research. The library by 1996 expects to convert 10,000 to 12,000 volumes annually to computer storage, which is about the number of volumes it adds to its holdings annually.

Project JANUS is funded by Columbia Law School and Columbia University Libraries. The School seeks funding for the remaining development program.

*Connection Machine, CM-2 and Thinking Machines are
Trademarks of Thinking Machines Corporation.

Project JANUS - The Electronic Library Development Project
Columbia University School Of Law

National Science Foundation Notice of Briefing Meeting

The NSF will hold a Briefing Meeting for the NSF/ARPA/NASA "Research on Digital Libraries" Initiative (Announcement NSF-93-141). The meeting will take place on Dec. 6, 10 am -12 noon at the Auditorium of the National Academy of Sciences, 2100 C Street NW, Washington DC. This meeting will be open to all parties interested in responding to this Initiative. For further information, please contact gbarber@nsf.gov

OCLC Awards Three Research Grants

DUBLIN, Ohio, June 17, 1993--The OCLC office of research has awarded three Library and Information Science Research Grants (LISRG) to university researchers for 1993. “We are pleased to be able to support these projects,” said Martin Dillon, former director of the office of research and current director of OCLC’s library technical services division. “University-based research adds an important dimension to our research agenda, and these projects promise findings that should be of broad interest to the library and information science community.”

The grant recipients and their projects are: Carolyn O. Frost, Ph.D., associate dean, School of Information and Library Studies, University of Michigan: “An Empirical Test of Gopher Searching Using Three Organization Schemes.” Gopher is an example of a commonly used protocol for searching networked information. Although the use of networked information is proliferating at an astounding rate and is providing unprecedented access to information, the organization of this information has not kept up with its use. Likewise, there is need for a greater understanding of information searching in order to design better searching tools, organize networked information more effectively, and assist information providers in the mounting of networked sources. There has been little research on how people use Gopher, or its effectiveness as a searching tool. The proposed project will study Gopher users’ information searching behavior, identify patterns and problems in the searching behavior or with the information retrieval, and recommend changes for improvement.

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The OCLC Library and Information Science Research Grant program awards grants of up to $10,000 to help foster quality research by faculty in schools of library and information science. Projects are generally completed within one year, and findings are published in the OCLC Annual Review of Research and in other scholarly communications. Application materials for 1994 will be available this November. For more information, contact the office of research. OCLC is a nonprofit computer library service and research organization whose computer network and products link more than 16,000 library in 47 countries and territories. (KS/NC)

FOR IMMEDIATE RELEASE. FOR MORE INFORMATION CALL:
Keith Shafer (614) 761-5049
Nita Dean (614) 761-5002

The On-line Book Initiative - Announcement

The On-line Book Initiative is being formed to make available freely redistributable collections of information. There exists huge collections of books, conference proceedings, reference material, catalogues, etc. which can be freely shared. Some of it is in machine-readable form, much of it isn't.

The purpose of the On-line Book Initiative is to create a publicly accessible repository for this information, a net-worker's library.

Information in the On-line Book Repository will be available for free redistribution. On-line access, magnetic media and other methods of distribution will involve reasonable charges for the services provided, not the information.

WHAT WE WISH TO ARCHIVE

All on-line materials (other than software collections) such as books, journals, catalogues, conference proceedings, magazines, manuals, maps, images, technical documentation, reference works, etc. The only software we are interested in is software specific to the viewing, manipulation, searching and maintenance of information in the repository.

Materials must be free of copyrights limiting redistribution by us or any individual or organization who receives them.

We also need pointers to collections of materials which may be available. For example, there are government collections of interesting data which are available at reasonable costs and do not limit further redistribution of copies obtained.

WHAT WE NEED FROM YOU

Beyond machine-readable material there are huge collections of printed material which could be redistributed if put on-line. We need people willing to organize informal projects to scan, type or otherwise get this material on-line for inclusion in the On-line Book Repository.

We need to get in touch with Library and Information Scientists interested in helping us create formats and structures for organizing the repository.

We need international participation to help ensure our efforts are useful to people everywhere.

We need people willing to participate in a Technical Advisory Board to help us guide our efforts.

We need involvement from academia, industry and governments to help us enrich this effort without bounds and make available a first-rate, freely available information utility.

We need involvement from publishers who have materials which can be included in the On-line Book Repository. Many books and reference works become unprofitable to publish by ordinary paper means. It's time to make these materials available!

We need involvement from the technical community to choose and implement multi-media software standards such as hypertext, mark-up languages, index and catalogue software, text retrieval, network access methods and more. Standards are critical to our efforts.

WHAT WE ARE OFFERING

WORLD.STD.COM is a public access UNIX system which will serve as the initial repository. WORLD.STD.COM is a large Solbourne file server (over 100MIPS, 4 CPUS, 256MB, 8GB.) We soon (2/2/93) plan to put OBI onto its own server machine which will be called OBI.STD.COM; that name will work now and will be correctly aliased on our end as needed.

Anyone can dial into the system and set up an account if they wish direct access (617-739-WRLD.) Accounts are charged and proceeds will be used to build the On-line Book Repository.

HOW TO GET INVOLVED

If you think you can help or want more information send electronic mail to:
obi@world.std.com

Or call us at Software Tool & Die, 617-739-0202. Or drop by our office and chat if you're in the area: 1330 Beacon Street, Brookline, MA 02146.

POSTSCRIPT

This started as an informal discussion group which called themselves “The KiloMonkeys Project” (‘‘Strong Typing For Weak Minds’’) who wanted to figure out how to get useful materials on-line and generally available. I have decided to make Software Tool & Die a home for this activity and formalize the project under the new name “The On-line Book Initiative.”