Indiana Libraries

INSPIRING STORIES

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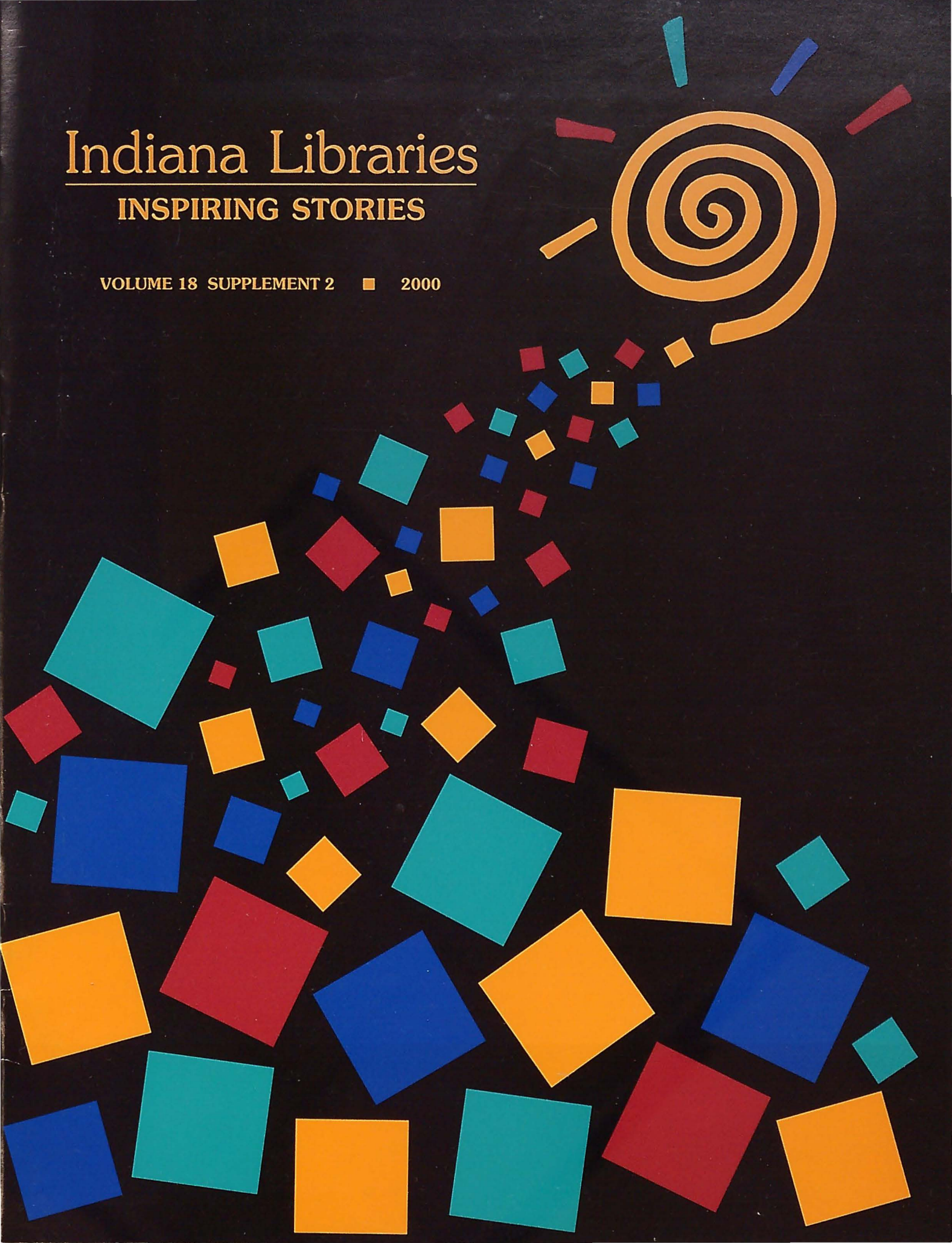

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C O N T E N T S

INDIANA LIBRARIES

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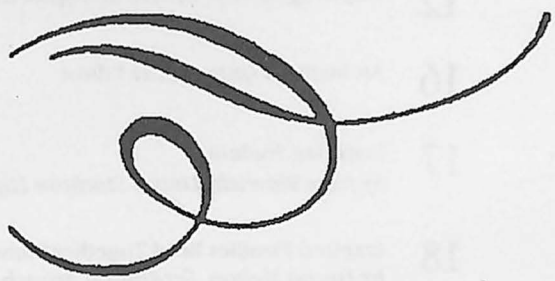

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INSPIRING STORIES

by Michael A. Williams,
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Guest Editor

The special issue of *Indiana Libraries* you now hold in your hands represents a celebration for a remarkable project, Inspire. This collection of articles and stories about how people use the services provided through Inspire reflect the various issues surrounding this unique project.

The first article by Matt Hannigan provides a lighthearted yet practical look at how far the use of electronic resources has come in a very short time. Like Matt I, too, remember searching DIALOG via a GE Terminet teletypewriter. I also remember my first interaction with a "real" computer and how long it took me to punch cards so I could "tell" the machine a joke to elicit its preprogrammed response printout...to get to the other side." The other side of Inspire is reflected in the fine article on the inner workings of Inspire by Mary-Elise Haug, technical administrator for INCOLSA.

The core of this special issue is devoted to *Inspiring Stories*. In these short pieces, citizens, students, media specialists, librarians, educators, and Indiana's senior Senator tell how they use INSPIRE to find the information they need and what access to this type of material means to them.

The real story of Inspire involves everyone in the state of Indiana because everyone is able to access the specialized information that is Inspire. In a first of its kind effort, contracts were written to ensure that anyone, anywhere within Indiana with access to the Inspire website would be able to use the high quality content. Similar efforts in other states allow only those members of a special group, be it a consortium of universities, schools or even public libraries to access the data provided by carefully selected vendors at significant cost.

Via Inspire and its authentication system anyone with Internet access within Indiana's borders can use Inspire from their computer at home, work, school, or their local public library. In this regard Inspire puts Indiana at the forefront of the revolution involving electronic access to information, and at far lower funding levels than less all-encompassing efforts in many other states. Inspire represents a true bargain to the citizens of Indiana. So read on, join the celebration that is Inspire and when you're finished log on to Inspire at www.inspire.net, explore, learn what you need to know today and perhaps consider writing to share your own *Inspiring Story*.

AT A LONG STRANGE TRIP IT'S BEEN: THE HISTORY OF ONLINE SEARCHING

by Matt Hannigan,
Indianapolis-Marion County Public Library

IN THE BEGINNING

When the editor asked me to write this history of the last twenty years of searching it wasn't because I'm the senior statesperson of online in Indiana. That title rightly belongs to Ann Van Camp (formerly of the IU Medical Library, now an independent searcher). Nor am I the intellectual backbone of Indiana's online community. That honor goes to Becki Whitaker of the Indiana Cooperative Library Services Authority (INCOLSA). Becki is online's nearest approximation to Star Trek's Mr. Spock. My role has been more like that of Forrest Gump or Jar Jar Binks — I just happened to be along for the ride. And what a ride it has been! One can picture future Carl Sagans and Jacob Bronowskis speaking of this era and the birth of the computer with the same breathless prose formerly reserved for the invention of the wheel. I can envision schoolchildren 200 years from now summing up the twentieth century this way, "That's when they invented the computer and the Internet. I think there might have been a war or something too."

In this article I want to give you a little flavor of the incredible changes which have led us from the days of Medline, ERIC, thermal printers, and dumb terminals to Pentiums, iMacs, the Web and, of course, Project Inspire. On this journey we'll talk about the early days of the big bibliographic utilities, the changes in search strategies and the learning curve both patrons and librarians have labored through.

You can't miss the timeline that runs through this article. What I find remarkable is how fast all of this stuff occurred. I sometimes feel like one of those cartoon characters who is left standing in his union suit after being whirled about in the dust of the Road Runner or Speedy Gonzalez.

When I first started my career in libraries back in 1978, a young scholar would drive to the library, find a parking space, locate the proper division, find a periodical index, guess at a subject and finally identify and locate an article on the history of the Punic War. These days the same young student jumps out of bed, logs onto the Net, types some keywords into an EBSCO database — and in a few moments is reading an article on the history of MTV. Ain't progress grand?

THE PRE-HISTORY OF ONLINE

Some tech histories trace the development of the computer back practically to the Pharaohs. In my research I found one writer who argued that the history of e-mail goes back 170 years to the invention of Morse code and the telegraph! Online has a more recent history. The two men who could conceivably be called the "fathers" of online are more nearly contemporaneous. Although the serious application of computers to document retrieval did not begin until the late 1950s, the intellectual foundation of online was laid a lot earlier — first in the work of Paul Otlet (1868-1944), and later that of Vannevar Bush (1890-1974).

TIMELINE

1960
- First printed circuits developed

1964
- BASIC computer programming language written
- IBM System/360 introduced

1967
- OCLC incorporated in Ohio

Otlet was a Belgian lawyer, bibliographer and "internationalist" (a charming Victorian-era word one doesn't see much these days). Bush had an amazing resume as one of the main inventors of analog computers in the 1930s, and later as Franklin Roosevelt's principal science advisor.

Otlet and Bush were motivated by an information explosion that was a by-product of the industrial revolution. Otlet was looking for a way to organize the vast literature of the social sciences, and Bush was likewise concerned with the literature of the sciences. Otlet was pretty much of a washout as a lawyer, but he became a bibliographer of some note, his imagination fired by the uses to which 3" by 5" cards could be put. In a 1934 monograph, *Traité de documentation*, Otlet speculated about the possibility of inventing new kinds of intellectual machines based on the notion of a desk in the form of a wheel surrounded by a mobile filing cabinet. Otlet also envisioned this desk having machines to transform speech into print and the reverse. Further, he opined that the newly created television would allow remote texts to be viewed at the desk (there may be a lesson here for our use of the Internet in the way early thinkers saw television as an educational medium). Bush expanded on Otlet's ideas in a 1945 article titled "As We May Think" appearing in the *Atlantic Monthly* of July 1945. Bush described a machine he called "memex" that could use associative links much as we see on the Web today. Bush saw the memex as a device in which an individual stores all his books, records, and communications, and which is automated for high speed and flexibility. This device, as Bush saw it, would be a desk with keyboard, screen and sets of buttons and levers. The information was to be stored on microfilm.

Bush, Otlet and others fired the imaginations of many researchers, but these ideas had to wait for technology to catch up. And it is interesting that even Bush envisioned microfilm as the storage medium, despite his background in analog computers. Some of the technological wonders necessary for their prognostications to be realized included:

1. An availability of vast amounts of bibliographic data in machine-readable form.
2. Mainframes with abundant cheap storage.
3. The creation of easy-to-use retrieval software.
4. Presence of a worldwide telecommunications system.
5. The invention of inexpensive terminals, microcomputers, and interconnecting equipment.
6. Really, really, smart librarians ;<).

The first of these conditions was met in the early 60s. The space race and national defense needs caused a rapid increase in government-supported research. The related expansion of university research led to an exponential growth in the number of scholarly papers published. The challenge of keeping track of all of this mish-mash prompted libraries, government agencies and industry to develop improved means of bibliographic access. Governmental agencies like the National Science Foundation (NSF), the National Aeronautics and Space Administration (NASA) and the National Library of Medicine (NLM) provided funding for some of this effort. NSF promoted database services at several not-for-profit agencies, NASA was looking to fulfill their mandate to transfer space technology to the private sector and the NLM began to develop systems to support the health service community. These efforts grew from the databases already in existence as print products. All of them used batch processing for searches — meaning you submitted a request and waited — and they stressed current searching rather than retrospective. Users, typically academic, submitted profiles to such groups as the North Carolina Science and Technology Research Center and the Knowledge Availability System Center at the University of Pittsburgh. These services were important from a development standpoint, but they reached only a tiny percent of the nation's researchers. These early projects provided work for what at the time were very tentative efforts on the part of two companies who were later to become major online bibliographic utilities —

TIMELINE

1969
- Compuserve founded as a computer time-sharing firm

1970
- Floppy disk invented

1972
- BALLOTS (later called RLIN) formed by Research Libraries Group
- First electronic calculators
- Intel's first microprocessor
- SDC introduces ORBIT service
- Lockheed introduces DIALOG service
- *New York Times* launches INFOBANK

Lockheed Information Systems and the System Development Corporation (SDC). These two firms won contracts to develop software to search databases from NASA, National Technical Information Service (NTIS), Educational Resource Information Centers (ERIC), and NLM (Medline).

Online services like Lockheed and SDC would later offer users the chance to interact directly with the database, building and altering search strategies with immediate computer-generated feedback. (You found nothing, puny human!) Searching moved toward retrospective content rather than current awareness. With the rise of the commercial vendors, the federal government became less involved in direct support but agencies such as NTIS, ERIC, NLM and NASA continued to provide grant fees to researchers, journal publishers, and indexers. These indirect subsidies in turn led to relatively inexpensive databases that the commercial vendors could offer.

SEA CHANGE OF TECHNOLOGY : FROM THE SILENT 700 TO PENTIUM SCREAMERS

There are probably hundreds of articles comparing the societal impact of the computer to that of Guttenberg's invention of moveable type in the 1450s. (As with many inventions, the Chinese actually came up with moveable type much earlier, but their alphabet was little known outside of China, and they didn't leave us any cool bibles.) Ironically the technology of printing remained fundamentally unchanged for more than 500 years until the invention of the computer. And interestingly, some of the earliest applications of the computer in the printing industry led to the development of online databases. During the early 1960s it became feasible for publishers of large information services, such as abstracting and indexing publishers, to use computerized phototypesetting. Citations or abstracts were entered into a computer, which then massaged the data, and finally output typeset material ready for printing. This saved time and money for publishing, and had the side benefit of creating databases.

The earliest machines for database searching were cousins of the machines used for data entry in the printing industry. A terminal was hooked up to a phone via an acoustical coupler (basically a couple of rubber cups on the back of a terminal with all the technological sophistication of a plumber's helper) that could accommodate the telephone handset and relay the data over the phone line. My own first attempts at online searching were done on a portable machine of that type called a Texas Instruments Silent 700. This is a machine roughly the size of a modern laptop. Its quiet operation was perhaps the only thing to recommend it. You'd dial up the vendor, wait for the tone and wrestle the handset into place. Speed was 300 baud, down in the range of your basic three-toed sloth. The TI Silent 700 could (quietly) spit out illegible characters on a spool of thermal paper roughly the consistency of waxed paper. Later, here at I-MCPL we graduated to a GE Terminet 1200, more than four times as fast as the TI and weighing roughly the same as a Volkswagen Beetle. These early machines were dumber than a box of rocks and relied on the power of the vendor's computers for processing. Searching was done online, but print output was typically ordered offline. Citations were printed overnight and sent the next day via snail mail. There was very little full text online, so you had to get hard copy somehow. If your library didn't own the magazine, you combed through OCLC or the *Union List of Serials* and sent a paper inter library loan form. When discussing searches with patrons I would often hear something like this, "Let me get this straight, you do the search for me, the results may or may not be relevant, I have to wait a couple of days for the abstracts, you may or may not have the full text, and I have to pay you an amount you can't tell me until after you've done the search?" Yeah, right.

The first microcomputers didn't produce a lot of excitement in the online community. Memory was minimal, there were no hard drives, and search software was poor. In fact the first search software for micros worked by turning that expensive micro into yet another dumb terminal. However as the personal computer came into its own, and search software such

TIMELINE

1974
- TCP designed

1975
- 1st PC — Altair 8800

1976
- 1st Apple Computer

1977
- Tymshare launches Tymnet
- Bibliographic Retrieval Servce (BRS) starts up
- First issue of *Online Review* published
- Dow Jones officially begins its "News/Retrieval" service

as ProComm, Crosstalk, and Smartalk was developed, more searchers began to search using PCs. The microcomputer brought with it the ability to upload and download search strategies, to print locally while offline, to e-mail results, to sort and edit output into a true report, and the chance to play Pac-Man or Asteroids when nobody was looking.

On the way to the current state-of-the-art Pentium-driven, high clock speed, huge hard drive, massive RAM, networked machines we now take for granted, there were a number of technologies which were somewhat less than successful. Bubble memory, videodisks, tape drives and 5.25 inch floppies have all been relegated to the scrap heap. One technology that just won't go away is the CD-ROM and its dreaded stablemate, the CD-ROM Local Area Network. Much like a garage-built dune buggy, databases on CD-ROM take constant tinkering — loading new disks, installing new software versions, messing with menus. In 1990 according to the *Gale Directory of Databases* there were 409 CD-ROM databases available, compared to more than 4600 in 1999. Like the much loved, much loathed fax machine, the CD-ROM LAN is the visitor that just won't leave the house.

THE TUMULTUOUS BIRTH OF AN INDUSTRY

For a Vietnam-era war protester like myself it came as something of a shock to discover how closely allied the birth of online was to the military-industrial complex and the Cold War. For instance the aforementioned Vannevar Bush was a co-founder of defense contractor Raytheon, as well as the overseer of the Manhattan Project in his capacity as Franklin Roosevelt's science adviser. As to the Cold War connection, both Lockheed and SDC were primarily defense contractors. Another major vendor/producer, the New York Times Information Bank, had no apparent defense connection. Infobank came to life in 1972 as an online index to the newspaper's morgue. However there is a great Cold War story Jeff Pemberton related in *Online* back in 1983 about his work as a sales associate for Infobank. According to Pemberton the first two customers of the Times service were the Central Intelligence Agency and the Defense Intelligence Agency. Not far behind them was the Soviet Embassy in Washington. When Pemberton went over to the embassy to show the new toy to the embassy staff (including Ambassador Anatoly Dobrynin) he tried to give a live demonstration. When he brought up his first abstract, it was practically unreadable, due to connection problems. However these weren't the kinds of connection problems we librarians would later face. Pemberton surmised that the phone line was tapped by every spy in Washington. Fortunately the embassy staff reacted with laughter, and we don't have to remember Pemberton as the librarian who started World War III.

Interestingly neither of the two men who headed up the online divisions at Lockheed and SDC, Carlos Cuadra (SDC) and Roger Summit (Lockheed), at first had much luck convincing the decision makers at their companies that online document retrieval had any economic future. In an attempt to persuade his management of the commercial potential of online, Cuadra mailed a questionnaire to several thousand subscribers of an NTIS current awareness service. The questionnaire was meant to assess the potential interest outside of SDC for using online. One of the recipients of the survey was a librarian at Lockheed, who promptly forwarded it to Summit. This survey and the implicit threat of competition from a rival were enough for Summit to goad his management into launching Lockheed Retrieval Service in 1972. (To that point Lockheed managers had been planning to dump Lockheed's DIALOG service, which they eventually did, selling it to Knight-Ridder in 1988 for the hefty sum of $353 million bucks.) Later that same year SDC came out with their ORBIT database. Another early major vendor was Bibliographical Retrieval Service (BRS), introduced in 1977 as a lower cost alternative to SDC and DIALOG.

Both DIALOG and SDC at first only provided access to the ERIC database, an offering which didn't exactly take the library community by storm. Both quickly grew until today DIALOG has more than 600 databases (a goodly hunk of the 5500 online databases currently available per the *Gale Directory of Databases*). SDC begat Orbit and was later subsumed by Questel, owned

TIMELINE

1978

- First issue of *DATABASE*
- *ONLINE* begins publication with September issue

1979

- *Reader's Digest* launches *The Source*
- Disclosure, Inc. announces new file of online corporate information

1980

- Radio Shack comes out with TRS-80
- Ziff-Davis buys Information Access Corp. and Management Contents

by France Telecom Multimedia. The current incarnation, Questel/Orbit, has survived by specializing in patent, trademark, and scientific databases. Such reinvention is necessary in an industry with all the stability of nitroglycerine stored in a kangaroo's pouch.

THE FAILURE OF MEDIATED ONLINE SEARCHING (OVERPRICED AND UNDERUSED)

It may seem odd to use the word failure in the context of online searching. As I am typing this at my reference desk, I am looking out at a room where at least eight patrons are on computers, some searching the Internet, others using CD-ROM databases (well okay, probably several are just slogging through chat rooms). By most measures, even ignoring the Internet, our patrons have enthusiastically embraced computerized searching of databases. But in the majority of libraries mediated online searching never really caught on with the masses. When libraries first began offering computerized database searches and typically passing on some of the costs to their patrons, only a relatively small number of patrons in public libraries took advantages of these services. (Academic and special libraries did a much brisker business, and some special libraries still do a lot of mediated searches.) Some patrons were uncomfortable with shelling out cash for searching which always had seemed to them to be free when performed manually. Some academic librarians talked about the "pizza rule" — that no student would be willing to pay more for a database search than for a large pizza. The price structure of online searching in those days (usually paying for clock time) meant that you had to be pretty skilled in searching, so the patron had to turn the actual search over to the librarian. That required a pretty carefully orchestrated verbal thrust and parry between librarian and patron. For very complex subjects it meant that the librarian had to receive a crash course in a technical subject from the patron, while the librarian had to convey to the patron some of the search logic and limitations. In those days bibliographic databases were rarely full text, so the best the patron could hope to receive was a printout of relevant citations along with the usual pain-in-the-neck retrieval issues. Do we own the article(s)? Is that volume at the library? Do I have to wait a couple of weeks for interlibrary loan? By that point the patron may well wish they had opted for the pizza instead.

At my library we attacked the problem as one of marketing. We put up signs advertising our fee-based database service, put articles in our newsletter, contacted the media, and shamelessly hawked the service at the reference desk. For all the response we received we might as well have been offering root canals. More successful were so-called quick-and-dirty searches, done in response to a reference query and treating a database as just another source. Back in the mid-1980s at I-MCPL we were performing about ten free searches per day as part of a normal reference search, but only a few fee-based searches per month.

THE RISE OF THE END-USER

Perhaps I shouldn't have been so surprised at the lack of response on the part of our patrons to mediated searching. The earliest online databases were designed with the assumption that searching would be done by end-users, presumably at their place of work. MEDLINE was designed for use by clinicians, NASA/RECON was meant for aerospace engineers, and LEXIS was created for attorneys' use. However developers underestimated the amount of effort and time spent in mastering the use of such systems, and it quickly became the norm for search intermediaries, librarians, to handle most search chores.

Later there was an attempt to once again reach end-users through the use of front-ends or gateways. These were software programs which were supposed to make different systems easier to search, and in some cases, be used on systems of more than one vendor. The big utilities also tried to expand their customer base to end-users. To this end DIALOG introduced Knowledge Index and BRS began the After Dark service. These feature-impaired versions of DIALOG and BRS were marketed to professionals such as doctors and business people at greatly reduced prices during off-peak evening hours. Ultimately librarians became the major

TIMELINE

1981

- IBM PC introduced
- BITNET (Because It's Time Network) starts at CUNY
- MINITEL deployed across France

1982

- Indiana Online Users Group (IOLUG) started
- Knowledge Index (DIALOG) and After Dark (BRS) aimed at end-users
- ABI/Inform debuts
- TCP/IP established as protocol

1983

- 1st hard disks in PCs
- IBM PC XT introduced
- Apple Library Users Group formed
- Information Bank contracts with Mead Date to distribute NYT databases
- American Library Association begins ALANET, electronic mail service

users of these services, logging on at night to save money when they worked the late shift at the reference desk.

Other search services were introduced which were aimed directly at the end-user. Services like The Source and Dow Jones News Retrieval finally had some luck marketing to end-users. The relative success of these early vendors set the stage for the rise of Compuserve, Prodigy, Genie, and ultimately America Online. People began to have a taste for doing research from their home computer.

Many libraries experimented with some kind of end-user programs. These experiments were most commonly tried out in academic and special libraries, and involved training a few eager and bright patrons on some systems. But what finally prompted large-scale end-user searching within the library was Infotrac from Information Access Corporation (IAC). IAC first introduced Infotrac as a microfilm reader — basically a machine devoted to a general magazine index on film, updated monthly. Soon Infotrac introduced a database which ran on an IBM PC using two floppy disk drives, and eventually switched to CD-ROM. Infotrac products offered several important enticements that made end-user searching workable. Libraries could pay one fixed price up-front and let patrons search to their heart's content without additional charges. The search interface was easy to use — quite a rare accomplishment in those days! A library could even pair Infotrac databases with a collection of full-text articles in film cartridges. Infotrac and other early CD-ROM products from such companies as Silver Platter and UMI taught me some (admittedly cynical) lessons about what the public really wants as opposed to what I thought they needed:

- Quality is no substitute for ease of use.
- Any charge for a library service is too much.
- Patrons will usually choose an easy search method over a better but more difficult one.
- Bad data is better than no data.
- Most patrons would rather do it badly themselves than have you do it well.
- Poor search skills can still lead to good results.
- People would rather print junk than transcribe anything good.

CD-ROMs in the library were (and still are) a great source of electronic information for our end-users, but several factors were leading to end-user searching at home. People were increasingly buying PCs for home use, schools were raising the general level of computer literacy, vendors were making better search interfaces, and some libraries were providing dial-up access to databases. However the great end-user revolution awaited the incredible growth of the Internet, and more particularly, the World Wide Web.

THE INTERNET AS *DEUS EX MACHINA*

There is a concept I remember from my time spent in World Lit in college called *Deus ex Machina* (literally God from the Machine). In Greek plays, when playwrights were looking for a resolution to the plot they would sometimes introduce a divine being who would bring order to the chaos of the plot. As the plays were acted on stage this divine being was introduced into the action by the use of a machine which lowered them onto the stage. Later this came to be more generally used in lit as any arbitrary plot device that artificially brings a resolution to the action, taking all the characters (and the reader) by surprise. This is kind of an interesting metaphor for the effect of the Internet not only on online searching, but also on many industries. Even though the Internet had been around since 1969 when it was introduced by the Advanced Research Projects Administration as ARPANET, practically nobody predicted what it would become.

Database vendors were slow to embrace the Internet, except in the sense of offering the Internet as an alternative path to dial-in. I had the good fortune to hear Barbara Quint (editor of *Searcher Magazine*) speak at an Indiana Online Users Group (IOLUG) meeting a few years ago. I remember a great line she had about some database vendors whose prices were quite high, "At the next bend in the road, they're going to fly off the back of the truck." Here's what her comment

TIMELINE

1984
- Apple Macintosh out

1985
- Wilsonline premiers
- CD-ROM prototypes demonstrated at ALA
- American Online founded

1986
- Intel ships 80386 chip
- Hayes introduces 2400 baud modem
- First Freenet (Cleveland)

makes me think of. If we view a patron's access to the information within a database as a marketing problem, we have too many vertical layers in the market. An author writes a piece, persuades a journal publisher to publish it, an indexer indexes it, a library buys an index, a patron comes to the library, the librarian instructs the patron in the use of the index, patron identifies the article, sees if the library carries it, and that it is not stolen or at the bindery, finally the patron hears the voice of the writer. This is the worst sort of vertical market, and every layer in between, (hopefully, excepting the librarian), can be viewed as an impediment to the fundamental communication between writer and reader.

At first blush something like what the Internet has become could be a vendor's dream. Simply hang out your shingle in the form of a web page and wait for the world to beat a path to your URL. But suddenly the product that you had been charging so dearly for can be deemed irrelevant. Why pay Disclosure for a report when there is Edgar? Why use a Dun and Bradstreet file to locate a company when there are sites like Hoover's, Switchboard, and CompaniesOnline? Why learn a complex proprietary language when search engines are so easy to use? Libraries like my own are contributing to the vendor's nightmare by bypassing vendors, contracting directly with database producers, and providing "free" access to our patrons via the Web.

It is too early to tell the ultimate effect of the Web on patrons' access to online databases. On the plus side the Web has created a lot of competition holding down prices of databases, it offers new search models that are easier for patrons, and it allows access where patrons need it — at home and at work. Still, it has its limits. The Web is growing at an enormous rate. Latest estimates suggest that the biggest of the search engines trap less than 15% of the 800 million pages on the Net. That percentage only reflects the publicly available Web. Proprietary content of vendors and database producers is hidden behind firewalls and is completely invisible to the major search engines. Yet another limit has to do with competition for limited resources. Our need to talk to others and our desire to be entertained by the lowbrow far exceeds our desire to do research. Will there be room on the Internet for research when the bandwidth becomes clogged by people downloading streaming video re-runs of Gilligan's Island?

THE AGONY AND ECSTASY OF THE LIBRARIAN

One of my favorite *New Yorker* cartoons shows a group of peasants gathered around a huge computer, carrying torches and shovels — recreating the climactic scene from the movie Frankenstein. That cartoon conveys the fear and anxiety of many librarians brought on by the introduction of online searching, but misses that little voice inside that said that maybe the monster had a friendly side.

In the early 70s while the DIALOGs, SDCs and INFOBANKs were just getting started, most librarians were helping patrons the traditional way. We marched our patrons to a paper index like *Reader's Guide*, or (shudder) *Chemical Abstracts*, and painstakingly walked them through the steps in using printed indexes. The persistent patron who suffered through the limitations of a paper index was rewarded with a list of citations that one then attempted to retrieve in the periodical stacks. I say attempted because of one of Murphy's laws — if it isn't at the bindery some youthful miscreant has probably purloined the article. (A favorite student trick was to keep a bit of dental floss in one's mouth — the wet floss was laid between the leaves of a bound periodical, weakening the paper enough to allow the article to be quietly torn from its moorings.)

Librarians in academic libraries usually had their first taste of online in the mid-1970s, and most public librarians first encountered online databases in the late 70s or early 80s. In the early days of online searching in libraries most of us were ripped by two conflicting emotions. One was fear — of the unfamiliar, of having to learn new techniques, of being "left behind". The competing emotion was a kind of elation brought about by basking in the new-found respect accorded us by patrons who needed us for our recently acquired knowledge of searching. The advance of online technology has been pretty confusing for librarians. First we thought we would be the great search interme-

TIMELINE

1988
- Knight-Ridder buys Dialog for $353 million

1989
- Maxwell acquires BRS
- Compuserve begins Internet e-mail connection

1990
- Prodigy Online Services begun
- Archie released
- Hytelnet released

1991
- Gopher released
- World Wide Web released by CERN

diaries (a select few were). Then we became tutors, helping our patrons in their role as end-users. More recently we thought we might become the great organizers of the Internet, or serve a role as electronic docents guiding our patrons through the complexities of search engines and databases.

It would be easy to quote some well-known statistics that would seem very discouraging to the future of librarians. A superficial skimming of such data indicates that we serve an elite subset of the general population, most people are reluctant to ask for our help, and our answers are about as accurate as Jeanne Dixon's prognostications. I come down on the side of those who believe that there is always room for a profession whose goal is to help people find answers. As long as people continue to be curious, I see a role for librarians.

THE NEW MATH OF SEARCH STRATEGIES

I have no idea if the human desire for organization has a biological basis. Did Peking man have his collection of spears carefully mounted by size on the cave wall? Did the Neanderthals stack bones by size and color? Modern man (or woman) is a fiend for organization. Human intellectual endeavor in the last century has forced us to carefully think through the organization, dissemination and retrieval of information. At home you might get away with storing stacks of magazines and newspapers in the basement with post-it notes marking the articles you don't want to forget, but in the library we need something a bit more formal. Cataloging, classification, indexing and abstracting are the noble, if tedious, tasks that have traditionally allowed us to find that great recipe for elephant ears. Library schools produced legions of librarians who could navigate print indexes with ease, confident in their mastery of title, author, and subject searching. Online first introduced librarians to concepts that were alien to us — Boolean logic, proximity, sorting, keyword-in-context, field limiting, etc. There was a massive re-training of librarians that needed to be done in order to bring us up to speed. In this state we were very fortunate to have INCOLSA and its talented staff to help. The library schools too began to churn out students who had been weaned on Nintendo and for whom the computer was no more intimidating than a toaster.

Our notions of searching online had to change when databases started including not only citations and abstracts, but in many cases the full-text of the article. Full-text databases were sometimes thrown together with few subject headings or actual indexing. It's great to have full text databases, but it does mean one must be more cautious in structuring a search, relying more on proximity operators, and being more exact in the choice of terms.

We finally have reached a point where most librarians can throw together a pretty good Boolean search of the ((librarian* and (salary* or wage*)) not peanuts) variety. The problem with Boolean searching is that it is very hard to teach to patrons. The arrival of the Web has brought with it a new set of search strategies for us to learn and to teach our patrons. Two of the more clever of these are natural language and relevance ranking, really two sides of the same coin. Type in a question (How much wood could a woodchuck chuck if a woodchuck could chuck wood?), or string together a bunch of relevant terms (woodchuck chuck wood), and the system performs a Boolean "or", and ranks the results by relevance based on such things as the number of occurrences of the terms, their proximity to one another, their frequency, or their location in the document. The beauty of this type of searching is that it can be mastered by a child, or even by a library director. Another new search concept brought to us courtesy of the Web is the equally clever "query by example". Find a relevant hit by any means, click on it, and the system displays other hits having the most words in common with the relevant hit.

These new search methods are pretty cool, at least in theory, but as was true with Boolean, we are searching for ways to correct the two major types of search errors — failing to find anything relevant, and more commonly, finding too much of the irrelevant. Some web search engines have been throwing in popularity of sites as a relevance criterion, but substantial improvements will probably require some kind of intelligent

TIMELINE

1992

- OCLC introduces FirstSearch
- America Online sells stock as public company

1993

- Dow Jones News Retrieval, Biosis, ORBIT, and BRS offer Internet acces
- Yahoo appears on theWeb as "Jerry's Guide to the World Wide Web"
- Mosaic Web browser developed by National Center for Supercomputing Applications

1994

- CARL unveils UNCOVER
- Mosaic Web browser offered free on Internet
- Jim Clark and Marc Andreessen found Electric Media (4/7)
- Electric Media changes name to Mosaic Communications (5/9)
- Mosaic releases Netscape Navigator Beta
- St. Joseph County Public Library (IN) 1st public library on the Web

agent, a software program with artificial intelligence and learning qualities that can assist a patron in a search. In the meantime, we librarians can find gainful employment by advising our patron that he isn't likely to find anything on experiments with dolphin intelligence by typing in "Flipper smart fish". It's nice to still be needed.

BEYOND Y2K

This section of the article exists so that not so very many years from now a librarian can look through this issue of *Indiana Libraries*, and get a good laugh from what I have to say about the future. In the very first general meeting of the Indiana Online Users Group I remember very well when an earnest young man stood up and announced sanctimoniously and knowingly that it would be 50 years before end-user searching made any inroads into our work as librarians. (Yes it was me!) Duh.

There are lots of articles written on the future of libraries. Some say that we will go the way of blacksmiths and milkmen, while others predict a role on the forefront of computer connectivity. Will we become a video store, a place for kids to play Nintendo, or a kind of continuing ed school for the digital illiterati? There is much less written on the future of online, but the two factors that I think will loom large are the gradual migration from the venerable codex to the electronic book, and more online offerings of audio, video, and still graphics.

The history of online searching to this point has largely had to do with magazine articles, directory information, and statistical data. The book is the next obvious candidate for online access. Remember that the original online databases came about because computer typesetting had already pretty much created the files. The same is true these days with books. An author writes a book, frequently in electronic form, and submits it to the publisher. If it's not already electronic, some struggling college student will make it so. At that point there would seem to be no technical reason it couldn't be made available to libraries or bookstores electronically. (I used the phrase "would seem to be" because of a conversation I had with a couple of sales people from Netlibrary. In their experience there are such a plethora of proprietary formats among publishers, that Netlibrary still has to painstakingly scan in most books whose rights they acquire.) Let's ignore for a moment the implications for the circulating collections of libraries that the advent of the electronic book might imply. However think of the reference power you'd have if you could search through the full text of books to find answers to reference queries! If you could limit a search to all the books published on French cooking in the last ten years and then search for a recipe for Crème Brulee, that would be pretty neat. Given 50 million monographs in the Library of Congress with an average length of 200 pages, we have the potential of accessing 10 billion pages of text, twelve times the current size of the Web.

The days of an online world composed largely of text are numbered. Some search engines are already offering limited search capability for non-text information like audio, video and software. For such searches to work well a lot of thought will have to be given to how one looks for sleds which resemble the one in Citizen Kane, or for a musical passage similar to Eine Kleine Nachtmusik, or a picture of Elizabeth Dole wearing a fake arrow-through-the-head.

We are certainly a lot closer to Otlet's and Bush's vision of a wired scholar. Perhaps "memex" won't be a large workstation, but something more akin to Maxwell Smart's shoe phone, or Dick Tracy's wrist communicator. If so maybe the current popularity of working from home will evolve to working from wherever you wish — mountaintop, beach, or garden. Now that's something worth sticking around for.

TIMELINE

1995
- Bill Gates announces Microsoft Network
- Thomson buys IAC for $465 million
- DataTimes launches EyeQ
- Microsoft introduces Internet Explorer
- CDP technologies acquires BRS, changes name to CDP Online
- Sun launches JAVA
- Windows 95 released

1996
- DIALOG on the Web

1997
- Microsoft charged with violating 1994 consent decree by Justice Department

1998
- Inspire Debuts
- Marion County Database Project funded by Indianapolis Foundation
- Questel and Orbit (SDC) search services merge
- Windows 98 released
- AOL buys Netscape

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INSPIRING STORIES: LETTERS TO INSPIRE FROM USERS ACROSS INDIANA

Dear Inspire,

I am helping as a "research assistant" with the updating of a physical therapy research text and use Inspire constantly. I use it to locate books in the Indiana University catalog and to search for the most recent journal articles that apply to the chapter I am currently working on. It is easier to use and has more information than some other sources on the internet. The best thing is I can use it at home at my convenience.

Sincerely,

Carol L. Baker PT

Inspire was the answer to my daughter's quest for information about Peyton Manning. She's an avid fan, has followed him through his football years with the UT Vols. She wanted recent information about him, and Indianapolis news does not reach her. So.... I was able to access Inspire and e-mail her articles.

Thanks! She is pleased!! Wish she could be more pleased with his rookie year with the Colts, as well!

Linda Zwick,
Lawrenceburg, IN

I am a student Rose-Hulman. I have found the Inspire service to be very valuable. It is a very convenient research tool. I really find the full-text journal articles useful for my research. I would love to see even more full-text journal articles. Keep up the good work.

Ed Hatfield
Rose-Hulman
Inst. of Tech.

On the library ownership vs. access:

It's easier to justify local property tax hikes for library materials that are owned and state funding for library materials that are accessed. My library board thinks local people with local taxes want library materials they can see and touch, and state funds for cyberstuff. And they will back this up through voting. Don't know how this idea plays elsewhere, but I thought it was interesting.

Carolyn Konnert,
Director, Bloomfield
Public Library

"Inspire has added an entirely new research dimension to our school media centers and is a fantastic way to prepare students for college." I will steal this quote for speaking engagements/demos at other libraries.

Kristie Bladen,
Bloomfield School
District

I continue to hear wild raving about Inspire — and I mean that in a positive way!

Margaret Mohundro,
INCOLSA

Recently, our library hosted our local Chamber of Commerce for a tour of our business information resources. Included on the tour was a demo of Inspire. We used sample searches for topics such as do's and don'ts for writing annual reports; how to quickly prepare a business luncheon; and putting together a program on safety in the workplace. We found articles on all these topics. Chamber members who attended were introduced to a new resource for their everyday business concerns. A library board member was among the group and gave us high marks for this effort. We are watching Inspire as it develops and support it in concept as a major way libraries can influence the development of information technology.

Dianne Hill,
Asst. Director,
Morgan County Public Library

I just found out about this web site through my daughter's PTO newsletter. I think that this is a fine idea that should be made public as much as possible. I have registered my daughter and I know that she will use your web site often. Thanks again!

Having read the article in the October issue of *Focus on Indiana Libraries*, I am responding with a couple of ways that we have used Inspire in our resource center. We are a middle school of 900+ students with internet access in all classrooms. Recently, all seventh grade students were in the resource center to work on an interdisciplinary unit on sea animals and fishes. Students needed to know facts including classification information on various sea creatures. The encyclopedia of animals section of inspire worked out beautifully! All the information needed was there and almost every creature was covered. We have also used the periodical database quite frequently. It has worked so well that we will most likely drop our Infotrac subscription next year. I love having access to inspire from my home computer. It helps with setting up for classes as well as helping with my own children's homework. I am spreading the word to all staff members about this great site!

Thank you again for Inspire!!

Judy Backe
Grimmer Middle School
Schererville, IN

We at the Walton Public Library are extremely pleased to have Inspire. It will save us $800.00 in 1999 (money that would go to MAS subscription). We have used Inspire to research several topics for student reports and for consumer information. Some specific subjects that come to mind are: fibromyalgia (a medical condition), nursing home patient abuse, and microwave oven safety. Our patrons like having the full text option as we are a small library with a periodical holding of only 60 titles. Please continue the great job managing Inspire. We really use it and are counting on it for all of 1999.

Robert Moore,
Library Director,
Walton Library

Just wanted to let you know that the Inspire databases have made a tremendous improvement on our ability to serve both faculty and students in the library. We have several teachers in Master's programs or continuing education who are being better served because of the Academic Database. We have not had immediate access to this type of information at the high school level and it is wonderful. Because of recent research successes, we are getting requests from the spouses of faculty members who are also working on degrees.

We just completed our first grading period which included senior research projects and were able to locate information on topics for which we had very little information in the library. It was very timely, since some students tend to wait until too late to get information through interlibrary loan.

Thank you for this service and I know we will find more and better uses of many of the databases provided through Inspire.

Shirley Bocock
Librarian,
East Central High School
St. Leon, IN

As I introduced all the seniors to Inspire in a formal lab situation, I gave each student a bookmark provided by INCOLSA. Afterwards I daily wore an Inspire pin. As I trained students one on one who came into the library, I would take off my pin and give it to them. After a few weeks students had learned about Inspire by word of mouth as well as training. I now give students either a pin or pencil when I "catch" them using Inspire. We have Inspire linked on our homepage so students can just click and go to it after they log on. Students are now asking when the other search engines such as "Ask Jeeves" will have pins and pencils for them.

Kathy Ellison
Forest Park Jr. Sr.
High School
Ferdinand, IN

We recently had a grandmother come into our library wanting to find a copy of an article her grandson had written. All the information she had was that it was published in the November 23, 1998 issue of the *Christian Science Monitor*. We do not have a subscription to this newspaper. I checked the "Inspire Newspaper Source" and saw that the *Christian Science Monitor* was indexed and had full-text access! I typed in her grandson's name, limited it to the *Christian Science Monitor* and the article appeared. I located and printed it out before the grandmother had a chance to ask me if the article could be printed! She was so pleased and thanked us profusely. She could hardly wait to read the article her grandson had written. Another Inspire success story.

Paula K. Hasler
Reference Librarian,
Marion Public Library

I went to my library totally frustrated... I had tried both the Internet and the library to obtain information for my paper, which was on JIT (Just-In-Time manufacturing.) My librarian suggested that I try your website. I used it and to my amazement, over 190 articles appeared for my paper. This helped me tremendously and I thank you. I have told everyone I know about your service and how it has helped me...thank you.

Amy Chesterman

The new database, NetFirst, is a fantastic addition to the databases. It is very easy to use and simple to help others with that it takes out some of the stress of searching the World Wide Web. I also like the abstracts because they help save time that would be wasted.

Thanks for adding this database.

Dear Inspire staff:

Recently, I received a phone call from the social services director of our local hospital. She was desperately searching for information on Asperger's Syndrome. An 8 year old was recently diagnosed with Asperger's and his parents were in dire need of information not only for themselves, but for the child's teacher. The teacher was at a loss for teaching this child in a classroom setting, having never heard of Asperger's Syndrome and its characteristics.

One visit to Inspire provided pertinent information and full text articles on Asperger's, including a nine page article targeted especially for educators who work with Asperger's Syndrome students. In addition, there were suggested related topics for further research by the family. There was even a review of a recent book on Asperger's.

Needless to say, Inspire was invaluable for recent information provided by reputable sources. The social services director was extremely pleased with the results, and I was once again reminded of Inspire's value to the community.

Dianne Osborne,
Public Services
Librarian,
Greenfield, IN

The Inspire database has amazing potential for spreading knowledge via the Internet. As a resident of the state of Indiana, I think that it is wonderful to have this resource at my fingertips. With a mere click of a few buttons, I can quickly access thousands of reliable sources on any of a wide variety of subjects. I consider it a real privilege to have that sort of vast repository of knowledge at my disposal.

The greatest triumph of the Internet is its ability to break down barriers and connect people in ways that no other technology ever has before. The state of Indiana could be heralded as a site of enlightenment unparalleled since the Great Library of Alexandria.

I am a journalist and use the database at my local public library for much of my research. I am absolutely thrilled to be able to access it from my home office.

Louisa Murzyn
Munster, IN

I am a 46 year old MSW student at Indiana University South Bend. I live 51 miles from the campus, and I rue the extra trips to the library to do research. I am so excited to have access to Inspire from my home. I have, in one week, been able to print off articles for my research on substance use disorders in adolescents, information for a colleague about Glasser's Choice Theory as it relates to children who fail in school, and sundry other tidbits for my own enjoyment. Thank you to whomever made this site possible. I have passed the address on to others, and will continuse to do so. What a marvelous resource. I appreciate it!

Kathy Rankin Simpson
Warsaw, IN

AN INSPIRED LETTER TO THE EDITOR

December 22, 1999

Dear Mr. Williams:

Indiana's public and school libraries are very important to me and my staff. I frequently visit libraries to encourage youth to read. Earlier this month I visited the Johnson County Public Library in Franklin and the libraries at Maplewood Elementary School, Wayne Township, Marion County and the Smoky Row Elementary School in Hamilton County.

Inspire provides an important link to the vast information resources in our state. The web links have been helpful to me in finding out more about youth reading programs throughout the state. I am encouraged by the continuing success of this project.

Sincerely,
Richard G. Lugar
United States Senator

INSPIRING STUDENTS

by Joan Warrick,
Linton-Stockton High School

Is your library or media center Inspired? Of course, singing the praises of Inspire and its offerings in this article is like preaching to the choir. Neither school media specialists nor academic or public librarians need convincing about its educational, technological or economical value. As professionals we are convinced, so how do we Inspire our students and patrons? As with any other technology, Inspire's success depends on key factors. First, the technology must be available to provide the users access to and successful retrieval of information. Nothing is more frustrating to users than to offer a resource that your current technology does not support. Second, just like any other resource, Inspire must meet a user's "need." Most importantly, users remember success.

Inspire provides avenues for a variety of information literacy skills.

- Inspire's homepage offers an excellent starting point for research.
- "How To Cite" link provides documentation guidelines and examples.
- Navigation experience enables users to search other complicated databases and sites.
- Full-text articles and sources supplement resources that small libraries cannot afford in their budgets.
- Optional interfaces offer users navigation and search alternatives.

Educating teachers and students at Linton-Stockton Junior and Senior High Schools to "Inspire" their projects has been an ongoing process. At first the high school media center offered only one computer with Internet access. On an individual basis, students used the one station and learned about Inspire as their research or projects demanded, most frequently those for health, psychology, social studies, and AP English. Eventually technology grant funds added additional computers to the high school and junior high media centers and each classroom. Thanks to the LSSC computer network, every student and teacher has access to technology. The Internet is available on a daily basis in the computer labs at the junior and senior high schools, in both media centers, and in every classroom. With trouble-free Internet access, logging into Inspire is simple...just provide the address. Several methods are employed at the LSSC media centers to publicize Inspire.

- Bookmark the site to the Favorites folder.
- Provide the URL address on project handouts.
- Send an Inspire link to teachers via email.
- Add the Inspire homepage link on the library or school home web page.
- Use the projector to teach a group its navigation and links.
- Publish a "how-to" article in the school newsletters and community newspapers.
- Make a brief presentation to faculty during in-service sessions.
- Offer workshops for teachers.

Inspire has evolved into an integral resource in the LSSC media centers. Try some of these strategies with your next research lesson. Your community of users will be "singing" Inspire's praises.

INSPIRED FAMILIES READ TOGETHER

SUMMER FAMILY READING CLUB

by Diana Melton, Ferdinand Branch Library, a unit of the Dubois County Contractual Libraries

WHO WE ARE

Ferdinand, Indiana, is a light retail, manufacturing and agricultural community of 2,500 citizens in the southern part of the state. Our one-room, 1,800, sq. ft. branch holds about 21,000 volumes, has 2 staff members, one Internet PC, one regular PC, a manual check-in/out system and manual card catalog. We are open 41 hours a week. Our Dubois County Contractual Library system operates 2 units, the Ferdinand Branch Library and the Dubois County Bookmobile.

AN INSPIRED BEGINNING

In March, we read in *Focus on Indiana Libraries* that Inspire Kits were available, so we called and asked for one. When the kit arrived, we were very impressed with the professional quality of the pencils, bookmarks, pamphlets and other items available, at a reasonable price. A "seed" was planted that perhaps we could use these materials for Summer Reading Program. Since January, my assistant, Trina Emmert, and I had been discussing ideas for the program. We knew we were ready to try something different.

A CHANGE IN FOCUS

For 15 years, I had participated in planning and executing summer reading programs at Evansville-Vanderburgh County Public Library. Over the years, EVCPL staff had discussed the incentive value, for the reader, of food coupons, and how to count books read, minutes of reading, or pages read. The program was persistently refined every year. Two of my former supervisors, Evelyn Walker, Assistant Director at EVCPL, and Linda Hahus, Head of Youth Services, have greatly influenced my current views on the how and why of library programming. In a nutshell, the philosophy is this: If the programming does not directly focus on the library's services and its collection, it should not be done. Our Board of Trustees for the Dubois Contractual Libraries has been very supportive of our efforts, so we felt a well-constructed new program was "do-able".

TESTING THE WATERS

These were the ideas Trina and I discussed in January and February, but I understood that old habits are hard to break. Summer Reading programs are for kids, aren't they? Food coupons and trinket incentives are traditional, aren't they? Huge circulation figures are important for funding, aren't they? Our answer is, "Maybe not!" Maybe summer reading club could be for everyone. Perhaps bribing the kids to read isn't the best incentive. Circulation is not a true measure of library usage or a measure of its importance to the community. Our major concern was the reaction of the children to the shift in the prize structure from individual incentives to prize baskets and drawing chance incentives. We drafted a plan and submitted it to storytime moms. The moms were very supportive and gave valuable advice.

THE INSPIRED PLAN

This is how we structured the program: 1) It would be open to all ages—infants to seniors. 2) Non-readers could be read to by family members. 3) Local merchants would provide prize baskets for incentives. 4) Participants would register at the library and pick up their Club Kits: a "Love My Library" bookbag from Demco, an Inspire pencil and bookmark, and their reading record. 5) Participants would complete tasks that teach about the library and read books to earn a chance at a prize basket. 6) Completing 10 tasks earns a chance at a grand prize basket.

THE TEN TASKS

Participants kept track of their reading and tasks completed. The tasks were designed to teach patrons about library services and collections. The tasks were: 1) Read a fiction book. 2) Read an information book. 3) Find "Inspire Indiana" webpage on home or library computer. 4) Read a book aloud to my family. 5) Read a library newspaper or magazine article. 6) Attend a library program. 7) Check out a library video or audiobook. 8) Ask a librarian about large print books. 9) Bring a friend to the library. 10) Read one more book to finish. After completing these 10 tasks, participants could enter their name in the grand prize

drawing and continue to read more books for more chances at prizes.

THE PRIZE BASKETS

To garner community support, we sent letters to 20 businesses for contributions. We asked each business to include family-oriented prizes. They could fill the baskets with goodies that inform the community about their business: inclucing logo items, candies, children's books about their profession. Ten businesses responded to our appeal. We asked for logo samples or letterheads to use in our publicity and displays. We publicized their participation with a news release, in-house displays, publicity flyers and the reading records. At the end of the program we photographed each winner with their basket, gave the winner a sponsor-addressed, stamped thank-you card and sent our own thank-you letter, with a photo of the winner, to the sponsor.

THE PUBLICITY

We used Inspire Clip Art on all of our flyers and bulletin board displays. The high-contrast magenta, blue, yellow, green and black color scheme was easy to duplicate and created sharp-looking displays. Trina used Velcro to hang the Inspire pencils, buttons and other items for display on the bulletin boards. She cut oversize confetti and generally translated the design concept of Inspire graphics to our needs. I gave a presentation to the Ferdinand Kiwanis and received funds to support our printing expenses. In April, we ordered bookbags from Demco and 500 Inspire pencils and bookmarks from ILF. In May, we delivered flyers to the Ferdinand Elementary School. For the final touch, a reporter from the "Ferdinand News" wrote a front-page newspaper article about our reading program.

"INSPIRED READING" AT A GLANCE

In June, participants visited the library, registered for the Club and received their Club Kits. They were very excited about the beautiful baskets from our sponsors. Three hundred forty people registered, ages 4 months to 81 years old. Readers used over 1,700 drawing slips. Additional programming included storytimes, a contest, a family book swap, a recycling craft, a teen volunteer club, a visit from the Dubois Dragons baseball team, a kids' collections show-and-tell, and a sock puppet chorus. Our most popular program was our "Inspired Families Computer Class", open to all ages, where we taught about the Inspire Indiana database. We created Inspire bags filled with promotionals and included a "Child Safety on the Internet" pamphlet from the Center for Exploited and Missing Children. We talked in general about Internet safety for kids and our policy for handling this issue.

HOW WE FARED

Participant registration tripled over last year. Materials circulation was 1,600 items over summer 1998. We feel we really reached more people about the services we provide and the different collections in the library. The gift baskets generated a lot of enthusiasm for all age levels. Another business called to participate next year.

WHAT INSPIRE MEANS TO US

Without access to the Internet and Inspire our services would be greatly hampered. Our budget does not allow us to buy the equipment required or the software products that Inspire provides. We found that patrons with the Internet at home did not know about Inspire. We are very grateful to our Indiana Legislature for the benefits Inspire brings to our modest library in this small rural town. Thank You So Much, Inspire!

INSPIRE: A VIEW FROM THE OTHER SIDE

by Mary-Elise Haug, INCOLSA

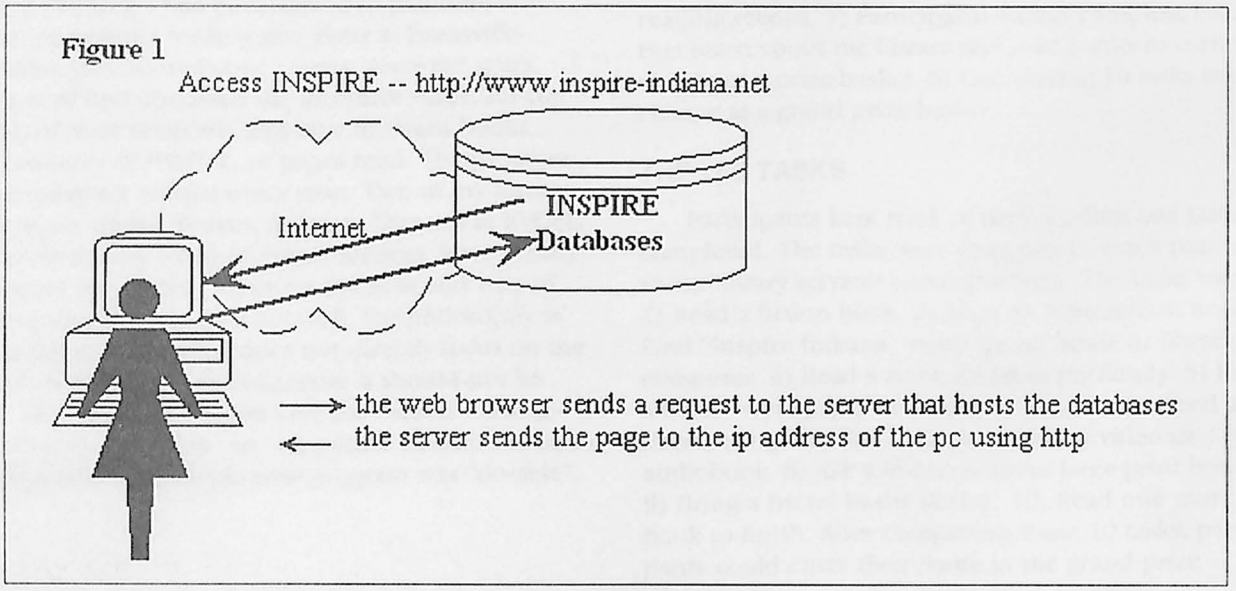
Inspire, Indiana's Virtual Library on the Internet, is a collection of commercial databases and other information resources that may be made accessible to any Indiana resident. Access requires a computer and an Internet connection. A virtual library is possible because Indiana has an existing network (IHETS/IndNET TCP/IP backbone) and there are standard protocols (http, z39.50) for communications as well as mechanisms for authentication, which in turn provide a client server infrastructure — a web browser connecting to a web server — that is available when developing a system. The greatest technological challenge in implementing Inspire has been to limit access to computers in Indiana. As Inspire staff have worked with individuals and institutions around the state a number of questions about our technical configuration have emerged. This article is an attempt to explain "how things work" inside the Inspire network. By looking at the components of the system: the client, the servers, the network, access control, and database interfaces, users may be better able to understand both the power and limitations of the system. For security reasons certain details will be omitted. Also keep in mind that technology evolves rapidly. Components of the Inspire system are regularly upgraded to add features, improve performance, and streamline processes.

THE CLIENT

I would imagine that most people reading this article have at least tried to access Inspire, Indiana's virtual library on the Internet. With an Internet connected PC and web browser, anyone in Indiana is a few clicks ... and a little typing ... away from retrieving full text journal articles.

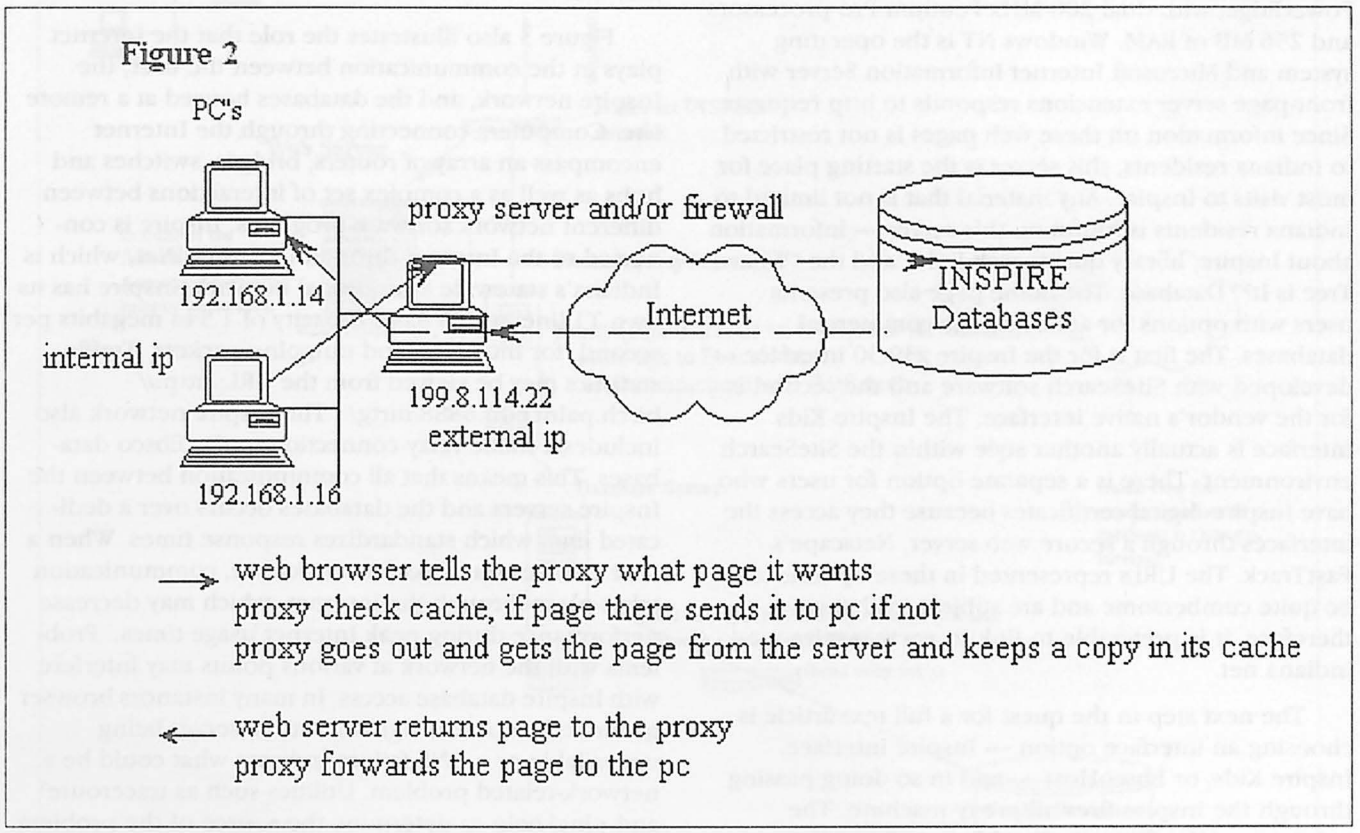
Figure 1 depicts a seemingly simple web transaction, where a user sends a request with appropriate Internet protocols (http[1]) and receives a reply in (http) from an Inspire server. Inspire functionality is based on the premise that the PC is configured with a client, the web browser. Inspire development work is not done on the client side; however, the capabilities of later browsers are utilized by server applications. We recommend Netscape 4.x or Internet Explorer 4.x with a screen resolution of 600x800 and 256 colors and do not guarantee that database interfaces will work with earlier browsers. (A no frames interface designed to work with lynx, a text browser, and meet ADA guidelines is in development.) Users have been known to experience difficulties if Java/JavaScript is not enabled.

Figure 1



THE CLIENT GOES THROUGH A PROXY OR FIREWALL

So you opened the URL http://www.inspire-indiana.net, selected Search Inspire NOW!, things did not go as expected — and you did not get the Inspire access denied page either. Such a scenario suggests that the PC in question may not access the Internet directly. It is becoming fairly common for schools, businesses, and other organizations to deploy firewalls[2] and/or proxy servers[3] between their internal networks and the Internet. Inserting a firewall or proxy server into the http transaction yields figure 2.



The configuration of a firewall or proxy server can affect a client's ability to access Inspire. This often manifests into one of three problems.

1. Traffic from a particular port is reject by the proxy/firewall. Due to the complexity of the Inspire servers and software, we have had to use non-standard ports[1] for the SiteSearch. Getting to a full text document requires the ability to receive http traffic from port 8008. *A change to port 80 is in the works.*

If the configuration is real strict, you may have to ensure that access to the inspire-indiana.net domain is allowed. Access to the database vendor's domain may also be required.

2. A school corporation (or other entity) uses a proxy service from an out of state vendor. The IP address seen by Inspire servers is no longer only used in Indiana. *An alternate means of authentication, digital certificates, is required.*

3. A user receives incorrect search results or cannot start a new session. In the case the proxy server is caching dynamic pages and serving them back to PCs instead of sending the request to the Inspire server. If at all possible, the proxy should be configured so that it does not cache URLs with *sessionid*. *The newest release of SiteSearch uses URLs that conform to a new standard, RFC-2396, which should help with caching problems. Staff is also investigating server settings and adding a page count to each URL to further reduce caching problems*

Adjusting browser settings so the document in cache is compared to the document on the network every time will also help with caching problems.

With the variety of proxy servers and firewalls available with a multitude of configurations, it is impossible to address every situation. In configuring Inspire servers and software, consideration is given to common firewall/proxy arrangements and every effort is made to conform to existing and emerging standards.

THE SERVERS

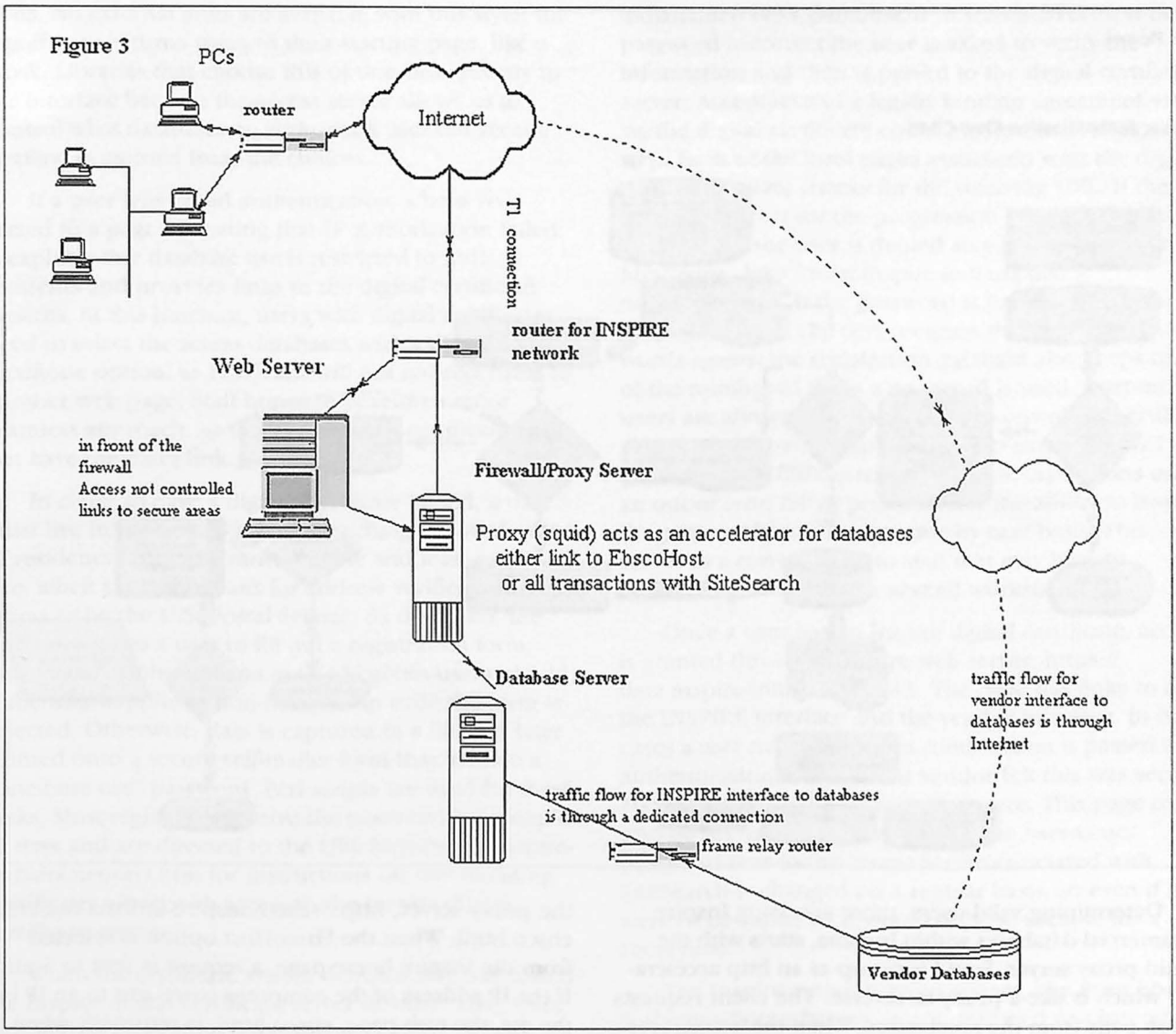
Figure 3 shows an expanded view of the http request depicted in figures 1 and 2. As illustrated, Inspire uses three servers in its current deployment. When a user opens the URL http://www.inspire-indiana.net, the primary World Wide Web server sends back the Inspire home page. This server is a Dell PowerEdge, with dual 200 MHz Pentium Pro processors and 256 MB of RAM. Windows NT is the operating system and Microsoft Internet Information Server with front-page server extensions responds to http requests. Since information on these web pages is not restricted to Indiana residents, this server is the starting place for most visits to Inspire. Any material that is not limited to Indiana residents is found on this server — information about Inspire, library quality web links, and the "What Tree is It?" Database. The home page also presents users with options for accessing the commercial databases. The first is for the Inspire z39.50 interface — developed with SiteSearch software and the second is for the vendor's native interface. The Inspire Kids interface is actually another style within the SiteSearch environment. There is a separate option for users who have Inspire digital certificates because they access the interfaces through a secure web server, Netscape's FastTrack. The URLs represented in these options may be quite cumbersome and are subject to change; therefore, it is preferable to link to www.inspire-indiana.net.

The next step in the quest for a full text article is choosing an interface option — Inspire interface, Inspire Kids, or EbscoHost — and in so doing passing through the Inspire firewall/proxy machine. The existence of the firewall, CheckPoint's firewall 1 product, is invisible to the user. All incoming and outgoing traffic to data is routed through the firewall, which listens on the external interface of a Sun Enterprise 250, Search, that has one 250 MHz processor and 512 Mb of RAM. All the Inspire Sun servers run under the Solaris operating system, which is a flavor of UNIX. The firewall is configured to optimize performance, so its impact on response time is negligible. Users are limited to selected ports and protocols on this machine and the machine behind it, increasing the security of the Inspire network and limiting down time that results from malfeasance. The downside is that if the firewall crashes both servers are inaccessible to network traffic as is access to the commercial databases. This machine also hosts a proxy server, Squid, which plays a substantial role in user authentication, to be discussed below.

The machine behind the firewall is a SUN Enterprise 450, Data, with 4 250 MHz processors and 768 MB of RAM. Data has significant storage capacity and is outfitted to accommodate local databases, if any are acquired. Thus far databases available through Inspire have been housed remotely (on a computer at the vendor's site). The Inspire interface, which has been developed using OCLC's SiteSearch product, operates on this machine. One of the SiteSearch components communicates with the databases to retrieve the full-text article and return it to the user.

NETWORK

Figure 3 also illustrates the role that the Internet plays in the communication between the user, the Inspire network, and the databases housed at a remote site. Computers connecting through the Internet encompass an array of routers, bridges, switches and hubs as well as a complex set of interactions between different network software programs. Inspire is connected to the Internet through IHETS/IndNet, which is Indiana's statewide educational network. Inspire has its own T1 line, which has a capacity of 1.544 megabits per second, for incoming and outgoing packets. Traffic statistics may be viewed from the URL: http://birch.palni.edu:8888/mrtg/ . The Inspire network also includes a frame relay connection to the Ebsco databases. This means that all communication between the Inspire servers and the databases occurs over a dedicated line, which standardizes response times. When a user chooses the EbscoHost interface, communication takes place through the Internet, which may decrease performance during peak Internet usage times. Problems with the network at various points may interfere with Inspire database access. In many instances browser generated error messages about the server being unavailable or a DNS failure indicate what could be a network-related problem. Utilities such as traceroute[5] and ping[6] help to determine the source of the problem. Many firewalls, including Inspire's, reject the IMCP packets sent by these tools. For troubleshooting purposes, trying another URL such as http://www.incolsa.net, which uses a different router and T-1 line, or http://www.ihets.org, which is nearby, provides useful information. If the browser generates error messages for these sites as well there is bound to be a network problem. When a network interruption occurs, it is beyond the control of Inspire staff. We do keep in contact with IndNET staff until the situation is resolved.



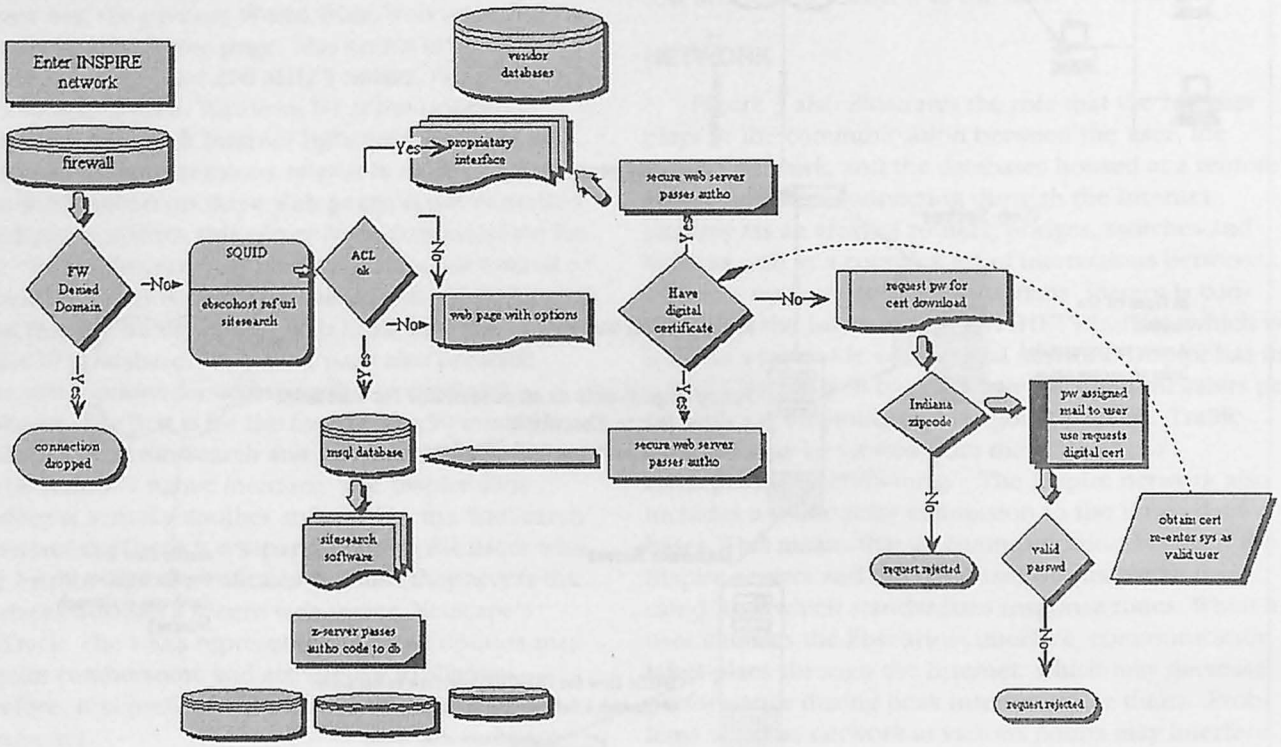
ACCESS CONTROL

The next step in retrieval of a full-text article is getting past Inspire's access control. What distinguishes Inspire from other statewide information access projects is the commitment to provide access to a diverse constituency, including homes and businesses, in Indiana. Traditionally, statewide library projects have authenticated users via IP addresses/domain name or library barcode, often leaving the implementation to participating institutions. There were no models available for extending access to any state resident without requiring a person to have a library card. When evaluating existing authentication schemes, it became apparent that the available technologies were premised on an identifiable user group, usually employees or students. Business enterprises, concerned about secure transactions for commerce, would register folks, regardless of geography. The more realistic solutions, notably username/password scheme (htaccess or database), cookies, and proxy servers, failed to address how to identify that someone was from Indiana in the first place. It became clear that there are two issues at work for establishing an authentication system for statewide access. The first one is how to verify that a user is a resident of a particular state and the second one is how to maintain information about valid system users once residency is verified.

The full-blown details of the user authentication system are outlined below. The short version is that Inspire staff maintain a list of IP addresses that are used only in Indiana. If the IP address of a computer matches one on this list, the user is passed on to the selected database interface. If an IP address is not on this list, but an Inspire digital certificate has been installed in the browser, access to the interfaces may be gained through the secure web server (https://data.inspire-indiana.net:443). If neither scenario applies, an Indiana resident may fill out a registration form and receive a password in the mail. That password is used to download a digital certificate. Figure 4 illustrates this process.

Figure 4

User Authentication Flow Chart



Determining valid users, those accessing Inspire commercial databases within Indiana, starts with the Squid proxy server. Squid is set up as an http accelerator, which is like a proxy in reverse. The client requests a web page from the accelerator. When the accelerator receives the request it gets the page from either its cache or the web server and then returns the page to the browser. Squid will only get the database interface pages for IP addresses and domains listed in specified access control lists (acl). The majority of libraries, schools, universities, and other Indiana institutions are authenticated in this manner. Local ISPs, who use specific IP addresses or domains in Indiana, are also included within the list.

When the proxy server communicates with the web server, requests appear to come from Inspire's internal network. Access to the database interface web server is limited to the internal network. For additional protection, the firewall software only lets machines behind it use the internal network address. The result is that a user's web browser cannot gain direct access to the web server associated with SiteSearch or the protected link to EbscoHost.

EbscoHost checks for a referring URL for its authentication. That referring URL is a link on page behind the proxy server, http://search.inspire-indiana.net/links/ebsco.html. When the EbscoHost option is selected from the Inspire home page, a request is sent to Squid. If the IP address of the computer correlates to an IP in the acl, the web page, ebsco.html, is returned; when the user clicks on the link to EbscoHost, the correct referring URL is in the browser properties. If a user types the URL for EbscoHost, http://www.epnet.com/cgi-bin/refurl30?incolsa.main.web, directly, an error message will be returned. If libraries want a direct link to EbscoHost on their web pages they need to link to the Inspire page or make arrangements with Ebsco for an alternative referring URL and logon identity.

The SiteSearch interface has a built in access server that uses a msql database. The authorization table accepts connections from Squid, as there is an entry for the internal network's IP address. If a user attempts to access port 8000 on the Enterprise 450 directly, the connection is rejected because the appropriate IP or domain is not listed in the authorization table. The system is set up to prompt for a user name and password. Incorrect values are embedded in the form. In some instances the Access Server authorizes valid users. For instance, Inspire staff support a version of the interface designed for libraries that lock down worksta-

tions. No external links are available with this style; the logoff page returns users to their starting page, like a kiosk. Libraries that choose this option link directly to the interface because the access server allows us to control what databases an authorized user can access; NetFirst is omitted from the choices.

If a user fails Squid authentication, s/he is redirected to a page indicating that IP authorization failed. It explains that database use is restricted to Indiana residents and provides links to the digital certificate services. At this juncture, users with digital certificates need to select the access databases with a digital certificate option, as FastTrack will not redirect users to another web page. Staff hopes to develop a more seamless approach, so those users with certificates will not have the extra link.

In order to have a digital certificate issued, a user must live in Indiana. When approaching the verification of residency issue, the most reliable and least expensive, albeit slowest, means for address verification seems to be the U.S. Postal Service. As deployed, the system requires a user to fill out a registration form, http://worf.inspire-indiana.net:443/cgi-bin/usera.pl/Add. If the user supplies a non-Indiana zip code the form is rejected. Otherwise, data is captured in a file and later printed onto a secure self-mailer form that include a "one-time use" password. Perl scripts are used for these tasks. Most registrants receive the password in a couple of days and are directed to the URL http://www.inspire-indiana.net/cert.htm for instructions on downloading certificates along with access to the Inspire digital certificate server.

When the certificate system debuted, users accessed the Inspire digital certificate server directly. They were required to enter their password with other data for the digital certificate. An auto-verification program associated with the server checked the password against the registration database. Passwords expired after 21 days. Most people abided by the one-time use concept; staff noticed that many users required several attempts before successfully downloading a certificate. A few seemed to abuse the lack of enforcement of the one-time use and send passwords to friends out of state (or were out of state college students with relatives in Indiana). The firewall became part of the authentication process, dropping such out of state users. It is possible to revoke certificates as well.

To compensate for suspect use and at the same time accommodate users who had difficulty downloading both the server and client certificate in one visit, a new mechanism for password checking was devised, forms were streamlined, and instructions were updated. Now, the process for accessing the digital certificate server begins with checking the mailed password at the URL: http://worf.inspire-indiana.net:443/cgi-bin/usera.pl/SearchIDForm. If the password is correct the user is asked to verify the information and then is passed to the digital certificate server. Acceptance of a legally binding agreement vis-à-vis the digital certificate could incorporated in this step. Each of the html pages associated with the digital certificate server checks for the referring URL. If the URL is incorrect for the progression of pages that issue a certificate, the user is denied access and sent to an html page, http://worf.inspire-indiana.net/nopasswd.html. If the password is incorrect an error message is sent. The perl program that checks passwords against the registration database also keeps track of the number of times a password is used. Currently users are allowed three attempts to download certificates and the passwords continue to expire after 21 days. We have the capacity to provide institutions using an out of state ISP or proxy service the ability to by-pass the password process on a case by case basis. This serves as a convenience to staff that may have to download certificates for several workstations.

Once a user has an Inspire digital certificate, access is granted through a secure web server, https://data.inspire-indiana.net:443. The page has links to both the INSPIRE interface and the vendor interface. In both cases a user name/password combination is passed for authentication. The current vendor felt this was secure enough because the server was secure. This page could also be set up as a referring URL. The username/password sent to the Access Server associated with SiteSearch is changed on a regular basis, so even if it were to be captured it would only be useable for a short time.

The Inspire authentication system, like most library authentication schemes, is not designed nor intended to be 100% secure. We do believe it is on a par with methods, such as referring URL, used by the vendors we work with. It does keep most people honest. Reasonable efforts are made to improve the system as any weaknesses are exposed as well as take advantage of advances in technology.

THE INTERFACE SOFTWARE

After being properly authenticated, a user is closer to the full-text article and now only has to perform a search/receive results using the database interface software. The interface software acts as a gateway between http requests and the databases stored in their raw format. EbscoHost is the native interface to EBSCO databases. Ebsco maintains EbscoHost almost entirely with modest adjustments, such as the home library link, possible through an administrative module. Both the Inspire Interface and the Inspire Kids Interface were developed using OCLC's SiteSearch Suite.

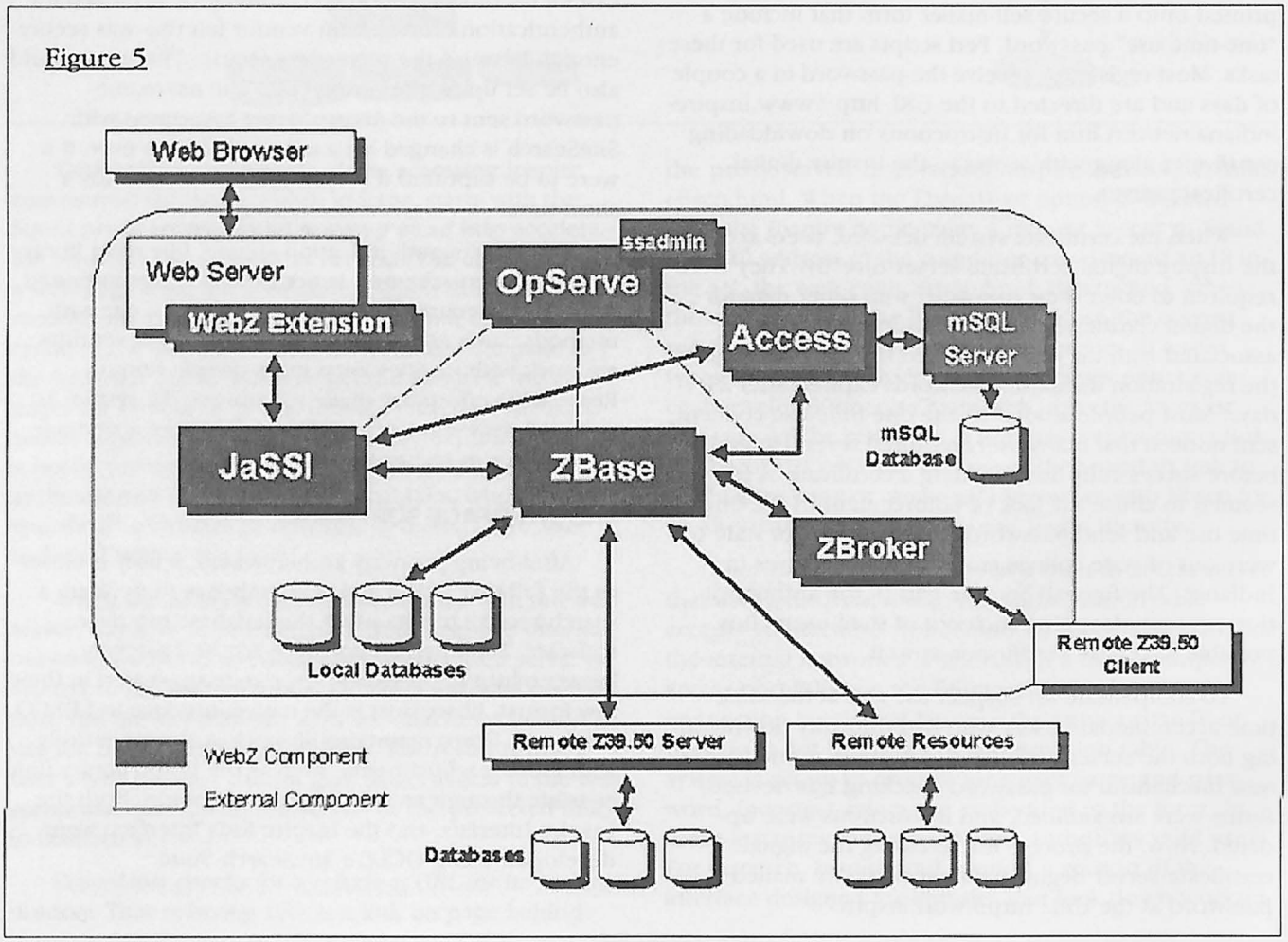
SiteSearch is written almost entirely in the Java programming language and is highly customizable. By employing the z39.50[7] standard, it allows users to search multiple databases from different vendors at the same time.

The SiteSearch software and interfaces are enhanced and administered by Inspire staff. Because searching is built on the z39.50, SiteSearch interfaces have some limitation when compared with vendor native interfaces; for example, browsing and many of the special search limits are not available through Ebsco's z39.50 server — the remote server in Figure 5[8]. Figure 5 illustrates the components of SiteSearch. The web browser talks to the web server through the Squid proxy server as explained earlier. In order to get to a full text article, a series of http requests are sent to an Apache web server, with SiteSearch's WebZ Extension. The requests are forwarded to JaSSI, which translates between http and Z39.50. Before any translation, JaSSI checks the access database. If all is clear a session ID number is assigned. This is how WebZ maintains a persistent connection with a web browser such that the server knows where to return search results. The JaSSI goes through Zbase (z39.50 server) to process queries and result sets.

The web pages that go with the SiteSearch interfaces are a combination of hard coded html and html generated from Java classes. Database results, returned through the Zbase, are formatted by an additional Java code based on database attributes. The differences between the Inspire interface and the kids interface demonstrate the flexibility in design and layout. Anything presented in html, such as search screens and results screens, can be significantly modified. Java classes that interact with Zbase and the remote server, such as parsing queries, are more cumbersome to alter.

From time to time z39.50 error messages appear in the Inspire interfaces. In many instances, after logging out of the current session and starting a new session the problem simply goes away. Such glitches may be a result of heavy traffic or packet loss or other communication problems that can occur anywhere in the complex array of interactions between the web browser and the remote databases. Errors indicating problems with results often fall in this category and are isolated rather than symptomatic of wider system problems. Error code 25 — "Z39.50 Search Error - 109/Database Unavailable" — happens when Ebsco takes a database off-line, making it unavailable through their z39.50

Figure 5



server. Sometimes the database is available in EbscoHost and other times it is out of commission for both interfaces. This error is outside the realm of the INSPIRE network. Additional errors are seen at times when either SiteSearch or the databases have reached their maximum user limit.

CONCLUSION

After looking at how a client and the Inspire servers interact through layers of networking, access control, and database interface software, it should be clear that the seemingly simple request for a full-text articles has considerable complexity to it. By understanding the role different components — clients, servers, networks, authentication, and database interfaces — play in Inspire database access, librarians should be better able to communicate with technical staff about Inspire access as well as to assist users with Inspire related questions or problems.

ENDNOTES

[1]HTTP stands for hypertext transfer protocol, a set of standards for transferring files from computer to computer across the Internet.

[2]A firewall is a combination of hardware and software buffer that organizations use between internal networks and the Internet. A firewall allows only specific kinds of messages (protocols) to flow to and from the internal network and the Internet.

[3]A proxy server acts as a gateway between an individual computer and the Internet. It speeds up loading web pages, while reducing bandwidth requirement of the Internet Service Provider. Some proxies are configured to prevent traffic from certain web sites based on a variety of criteria.

[4]The port refers to the number part of a URL. It is to the right of the colon, i.e., http://search.inspire-indiana.net:8008. Every service on the Internet listens to a particular port. Web servers normally listen to port 80.

[5]Traceroute (tracert) utilitities show the route taken from a PC to a particular Internet connected machine. Problems getting to the destination address suggest network difficulties.

[6]Ping is used to tell if there is some rudimentary connection between a pc and an Internet connected device.

[7]Z39.50 is the Information Retrieval Service Definition and Protocol Specification for Library Applications. This standard, used by WAIS, specifies an OSI application layer service to allow an application on one computer to query a database on another. Z39.50 is used in libraries and for searching some databases on the Internet.

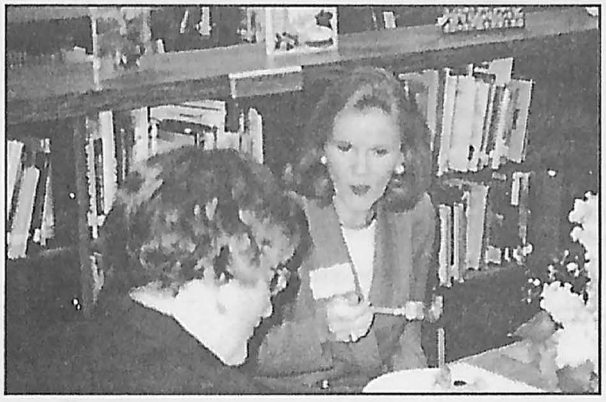
[8]Hagler, Mike. "WebZ System Diagram". Available http://cypress.dev.oclc.org:7301/help/sa/sa_04-10-01r.html (5 Oct 1999).

AN INSPIRED THANK YOU

by Sue Moeschl,
Carmel Clay Schools

Above: Nancylee Buckley, Director of Curriculum, Carmel Clay Schools.

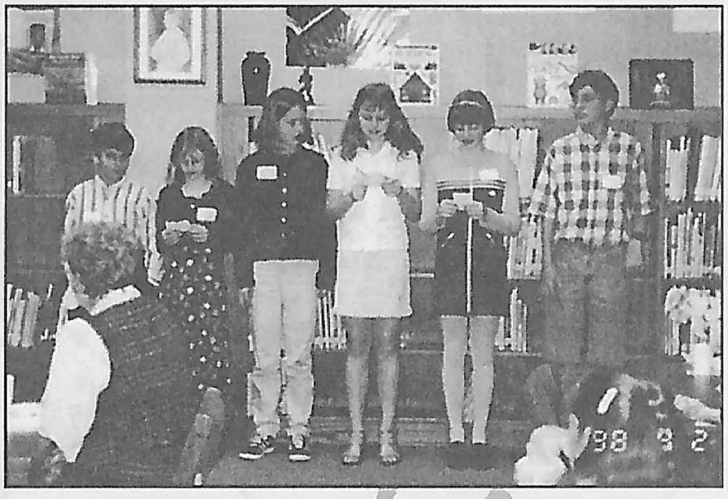
Above: Media specialists and students have breakfast and talk about Inspire with State Representative Gerald Torr.



During National Library Week the media specialists of the Carmel Clay schools gathered together along with students from Orchard Park Elementary to thank their Indiana legislators for Inspire. The students demonstrated the many uses of Inspire to State Senator Teresa Lubbers and State Representative Gerald Torr. Orchard Park Media Specialist Liz Quakenbush helped the students plan and refine their presentation, but as the photos show, the students handled this instructional session while the adults enjoyed breakfast.

Above: Linda Gunderson, media specialist at Carmel Elementary School, and Steve Tegarden, Superintendent, Carmel Clay Schools.

Below: Students from Carmel Clay Schools and Orchard Park Elementary give a presentation at the Inspire breakfast.



Left: Mary Jane Jones, media specialist at Smoky Row Elementary, discusses Inspire with State Senator Teresa Lubbers.

THE ONCE AND FUTURE INSPIRE

by Michael A. Williams,
Indianapolis-Marion County Public Library

The Inspire Project began like all things, as an idea. An idea initially formed in the mind of Indiana Cooperative Library Services Authority Executive Director, Millard Johnson in 1995. An idea that Johnson then proposed to Indiana State Library Director, Ray Ewick. An idea this pair of visionaries then proceeded to take to the Indiana State Legislature for funding. An idea based on the needs of not only Indiana's Libraries, but each of Indiana's citizens. In short, an idea whose time had come.

Inspire stands for Indiana Spectrum of Information Resources. It functions as the foundation of Indiana's virtual library on the Internet. It offers a wide range of databases in support of Indiana residents seeking information of educational, cultural, economic and personal interest. Inspire is operated by INCOLSA, the Indiana Cooperative Library Services Authority under a contract from the Indiana State Library. Funding for the databases is provided by the Indiana State Legislature as a part of the biennial budget.

Much of the idea behind Inspire predates the era of the digital computer altogether. In his landmark article "As We May Think" in the July 1945 issue of *The Atlantic Monthly* Doctor Vannevar Bush outlined both the problem of information overload and the idea for a scholar's workstation which would provide the user with easy access to virtually unlimited stores of information:

The difficulty seems to be, not so much that we publish unduly in view of the extent and variety of present day interests, but rather that publication has been extended far beyond our present ability to make real use of the record. The summation of human experience is being expanded at a prodigious rate, and the means we use for threading through the consequent maze to the momentarily important item is the same as was used in the days of the square-rigged ships.

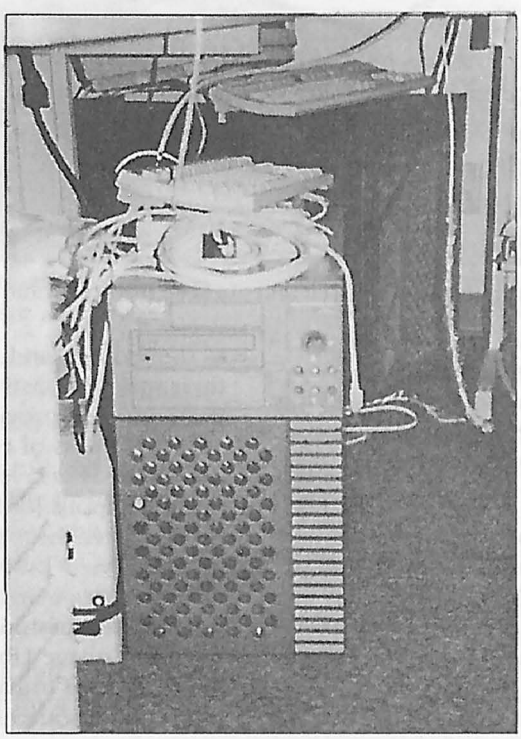
Consider a future device for individual use, which is a sort of mechanized private file and library. It needs a name, and, to coin one at random, "memex" will do. A memex is a device in which an individual stores all his books, records, and communications, and which is mechanized so that it may be consulted with exceeding speed and flexibility. It is an enlarged supplement to his memory.

Thanks to advances in computer science, the power of access to the Internet, and the variety of information provided by the databases which make up Inspire, Bush's idea of the memex as proposed in 1945 has been largely realized with almost haunting precision.

THE HISTORY OF INSPIRE

The working history of Inspire dates back to November 1996 when the Inspire Steering Committee chaired by Charr Skirvin of the Plainfiled Public Library began its work. The Steering Committee was assisted by two other working groups: the Technical Working Group and the Database Selection Working Group. Together these groups designed the basic form Inspire would take. In December 1996 the Indiana Library Federation became formally involved to assist the project in seeking funding from the State Legislature through its Legislative Committee and legislative advocates. In February 1997 the project had advanced sufficiently enough to allow the Steering Committee to issue a Broad Agency Announcement to vendors seeking proposals for databases and the cost to make them available to every resident of Indiana.

The Inspire Server



In May 1997 the Indiana State Legislature appropriated $1 million a year for Project Inspire. Combined with funding from grants and LSTA funds, Inspire had money for databases, equipment and personnel. By July 1997 the BAA had been released to vendors and an evaluation team made up of members from the Steering Committee and the two Working Groups began sorting through the responses.

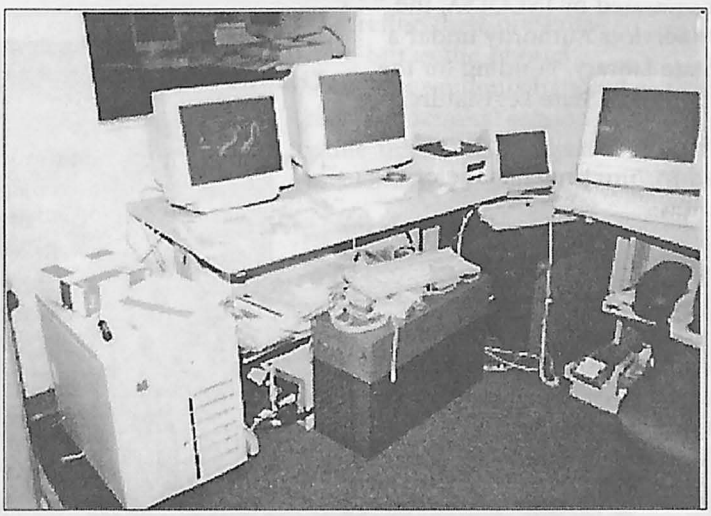
While certainly not the first effort at licensing a group of commercial databases on a statewide basis—the Galileo project in Georgia receives due credit for that accomplishment—Inspire was the first such effort to provide such access to everyone in the state. The Galileo project and others similar to it provide access only to select members of a consortium, rather than anyone anywhere in the entire state. Verifying that a user was in fact searching the databases from a computer in Indiana became a key issue in the process. Using the BAA allowed vendors to offer a variety of ideas to the groups on accomplishing this important task. Mary-Elise Haug, Inspire System Administrator, describes this process in intricate detail in her article elsewhere in this issue. Suffice it to say that "authentication," as this process is called, remains a behind the scenes key to keeping Inspire running, and that a project of this magnitude had not been attempted before.

To keep the project moving and bring Inspire from idea to reality, Justin "Juck" Lowe was hired in September 1997 to serve as Project Manager. Before Juck came aboard Becki Whitaker was largely responsible for handling the project within INCOLSA. Juck recalls that as late as November 1997, even after the selection of EBSCO as the database provider, Inspire had no machines and no system administrator. Mary-Elise Haug was hired to correct the latter problem. Sun Enterprise models 250 and 450 arrived to correct the former problem.

In January 1998 Inspire became available to the citizens of Indiana at http://www.inspire-indiana.net. It is the first such effort to be available to anyone anywhere within the state of Indiana, as long as they arrive at the Inspire website from an Indiana based Internet service provider, library or school. To celebrate this accomplishment a virtual ribbon cutting was held at the Indiana State House in February. At this time the Indiana Legislature was officially introduced to Inspire.

Throughout 1998, Inspire was upgraded and enhanced with a more sophisticated user interface and with the addition of Digital Certificates to allow citizens using non-Indiana based Internet service providers such as America Online and Compuserve to access the full content provided through Inspire. In October 1998 the Inspire staff was completed with the additions of Howard Trace and Marla Rutherford to provide enhanced technical support to Inspire users. That support was important because on November 18, 1998 Inspire made history. It served 117,500 pages of full text information, breaking the 100,000 page per day barrier for the first time.

During 1999 Inspire continued to grow and mature. New and improved databases were added throughout the year and a special user interface, Inspire Kids, was developed to aid searching by younger users. Midway through 1999 it was time to prepare for Inspire's second biennium and the process of choosing the databases that make up the system began anew.



The computer equipment it takes to keep Inspire up and running

To begin the database selection process the Steering Committee recruited representatives from all sorts of Libraries and School Media Centers, among them this author representing the Indiana Library Federation. Members of the group spent their time reviewing nearly 40 pounds of information provided by vendors in response to the Broad Agency Announcement for Statewide Access to Electronic Databases. The group shared insights and experiences as they sought and received input from each other and their various constituents. Trial access to the proposed databases was provided as a means to test the veracity and usefulness of each one. Meetings were held to determine which vendors and what databases to invite to Indianapolis for formal presentations and further review. After these presentations, more meetings were held to review best and final offers and again evaluate the databases being proposed. The group under the watchful leadership of Larry Frye, Head Librarian at Wabash College Library, worked diligently to provide the citizens of Indiana with the widest variety of useful information sources for the money available.

INSPIRE TODAY

Currently Inspire consists of 21 databases covering topics such as education, business, health, biographical information and Spanish language resources. The original Ebsco databases have been supplemented by database products from Gale and other sources to enhance and expand the breadth of coverage provided by Inspire. The databases offered are:

Academic Search Elite – Covering the general sciences, the humanities and the social sciences with 1,200 journals available in full text form and indexing and abstracts for over 3,000 journals.

Biography Resource Center – Providing in-depth biographical information through 142,000 biographies including 7,000 portraits on both current and historic persons.

Business Source Premier – Covering topics such as accounting, management, economics and international business, with nearly 2,000 business journals indexed and nearly 1,300 full text journals.

Clinical Reference Systems – Offering essays and images on topics such as women's health, sports medicine, pediatric health, cardiology, and drug information.

Ebsco Animals – Providing in-depth information with full text and images on a wide variety of animals and animal related topics.

Ebsco Online Citations – Covering over 2,700 titles this database of publisher provided citations includes many medical, scientific and technology oriented titles.

ERIC – Indexing and abstracts for over 750 education related journals.

Funk & Wagnall's New World Encyclopedia – Providing the full text to over 25,000 records.

Health Source Plus – Offering full text for 23 books, 1,065 pamphlets and full text from 255 periodicals covering consumer health information topics including nutrition, exercise, self-care and drugs.

Informe! – In Spanish and featuring full text coverage of 40 of the most popular Spanish language periodicals with indexing and abstracts for 60 titles.

MAS Fulltext Ultra – Providing full text to over 1,000 historical documents such as The Constitution, The Federalist Papers, famous speeches, the CIA World Factbook, the Department of Education's College Guide, nearly 5,000 Magill Book Reviews, and reports and special issues from over 500 K-12 magazines.

MasterFILE Premier – Indexing and abstracts for over 2,700 periodicals with full text from over 1,800 general reference, business, consumer, health, science and multi-cultural periodicals.

MEDLINE – Providing authoritative professional information for the health sciences and using the Medical Subject Headings or MeSH created by the National Library of Medicine to index over 3,800 biomedical journals.

Middle Search Plus – Offering nearly 100 full text magazines geared toward Middle School research covering general reference, health and science topics.

Netfirst – Featuring point-and-click access to Internet resources of interest to Libraries and their users from a database of nearly 120,000 records.

Newspaper Source – Daily updating from 143 major U.S. and international newspapers including full text from *The Chicago Tribune, The Christian Science Monitor, The New York Daily News,* and *The San Jose Mercury News.*

Primary Search – Providing full text from 50 children's magazines as well as The World Almanac for Kids and Essential Documents of American History.

Professional Development Collection – Featuring full text for nearly 250 journals and abstracting and indexing for over 330 journals targeted toward professional educators.

TOPICsearch – Searching by topic, keyword or natural language provides access to 40,000 documents selected from 2,500 sources on social, political, economic and scientific issues of interest in today's classrooms.

USP DI Volume II, Advice for the Patient – Providing patient oriented drug information in lay rather than professional language, including brand names, proper usage, precautions and side effects.

What Tree Is It? – Answering the perennial question using leaves and fruit to identify over 60 common trees.

All of the resources are now available at an even simpler web address, http://www.inspire.net. A simple user interface provides a unified experience and the possibility of a combined search across the various databases. The current lineup of databases resulted from an increase in funding for Inspire's second biennial budget and the hard work of the database selection committee

THE FUTURE OF INSPIRE

While no one can fully know what the future holds, Inspire is poised for an even greater role in the information needs of tomorrow. With the continued explosion of Internet access both through traditional

personal computers and newer so called information appliances, the role of Inspire as the foundation of Indiana's Virtual Library is set. New and enhanced databases continue to be added, as they become available from the vendors. New services being investigated for Indiana's Virtual Library include new user interfaces, user initiated interlibrary loan, a user searchable union catalog of all materials in the state, and newly created or organized unique content of interest to Hoosiers.

New user interfaces are being developed and evaluated with both ease of use and powerful options in mind. The Inspire of today will certainly become a more robust tool of tomorrow. At the most recent Indiana Library Federation Annual Conference, Steven Coffman from the County of Los Angeles Public Library challenged those present at the Indiana Public Libraries Association/Indiana Library Trustees Association Luncheon to use Inspire to build an online union catalog linking every library within the state. Such a linked catalog would facilitate easier interlibrary loan. INCOLSA has recently issued a BAA to support just such an endeavor.

Sir Arthur C. Clarke presents much of the concept behind Inspire in his Third Law: "Any sufficiently advanced technology is indistinguishable from magic." Access to high quality, authoritative information, any time, anywhere, by anyone in Indiana would certainly seem to be technological magic at its finest.

Inspire today represents an historic effort to provide everyone in Indiana with access to high quality useful information. It is not magic, but the result of concerted efforts on the part of visionary leaders like Millard Johnson of INCOLSA and Ray Ewick of the Indiana State Library as well as the hard work of all the librarians, media specialists and staff members involved since its inception. Inspire relies on funding provided by the Indiana State Legislature for its continued existence. This funding is dependent on continued usage of Inspire by Hoosiers. In Inspire's first year 10 million pages were served. That figure doubled in 1999 and current usage figures show the system on pace for 2000 to serve 30 to 40 million pages. At the rate of more than 80,000 pages of full text information per day Inspire users are offering their hopes for a bright future. With ever more and easier to use Internet access devices on the horizon, Inspire and Indiana's Virtual Library are ready to demonstrate their own technological magic.

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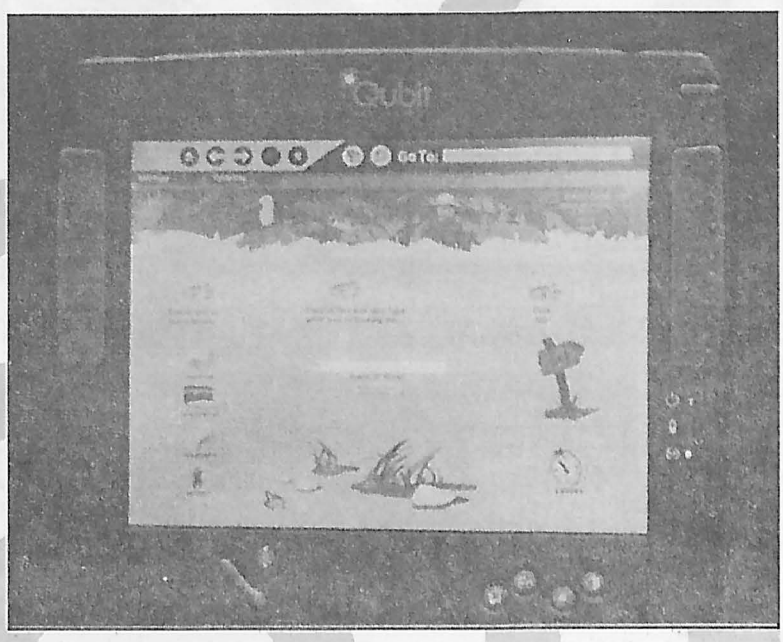
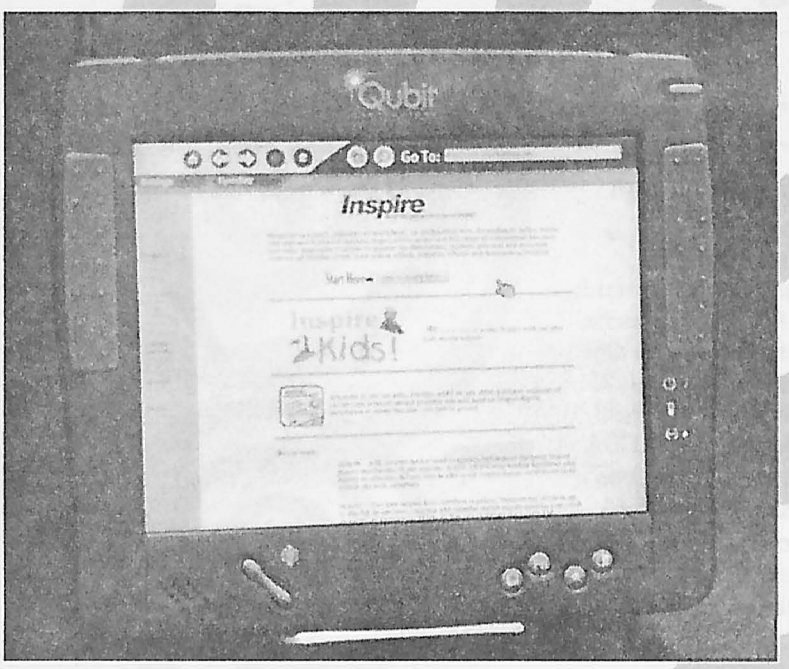
THE FUTURE OF INSPIRE?

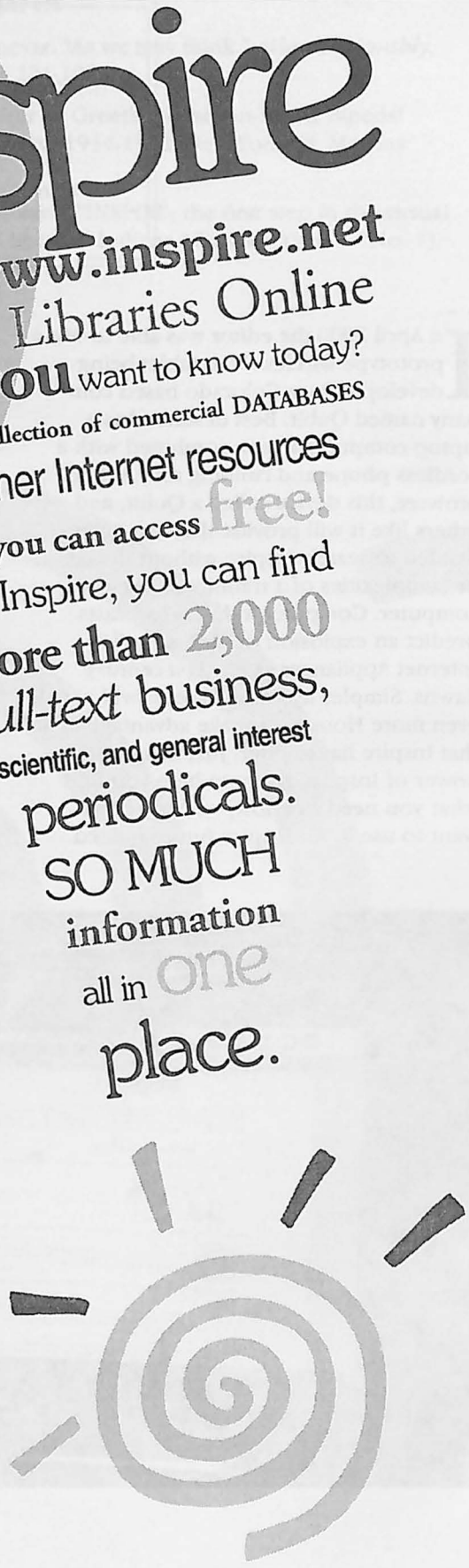
by Michael A. Williams,
Indianapolis-Marion County Public

In April 2000 the editor was able to test a prototype wireless Web tablet being developed by a Colorado based company named Qubit. Best described as a laptop computer screen combined with a cordless phone and running only a Web browser, this device called a Qubit, and others like it will provide the Web access needed to search Inspire without the costs or complexities of a traditional personal computer. Computer industry forecasts predict an explosion of such so called Internet Appliances as the 21st century dawns. Simpler less costly access will enable even more Hoosiers to take advantage of all that Inspire has to offer. Just imagine the power of Inspire, ready to help you find what you need to know, wherever you want to use it. An Inspire future indeed.





2000 Inspire Public Awareness Campaign

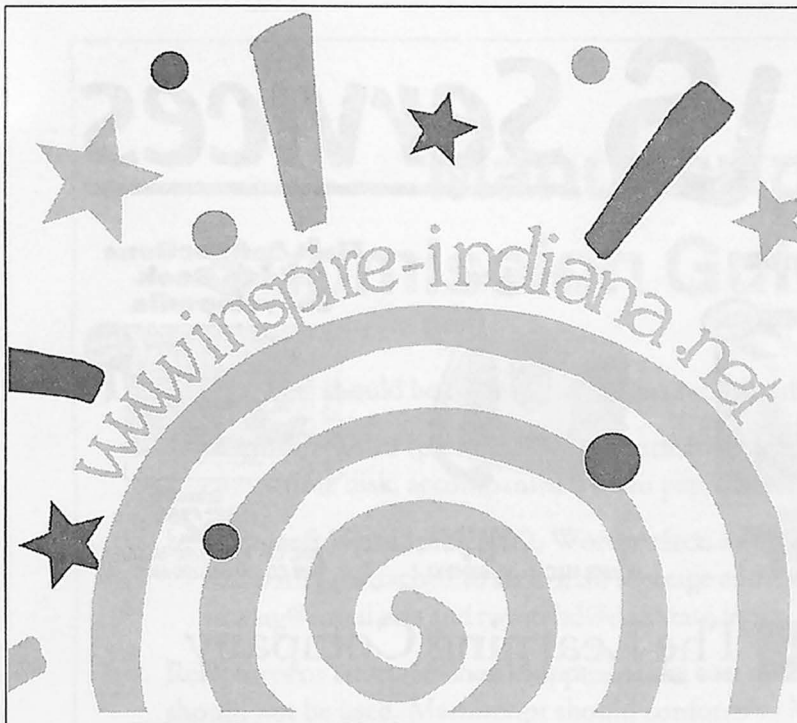


Half-page Inspire advertisement running in the *Indianapolis Business Journal (IBJ)*, beginning in September 1999

About the IBJ...

Each issue of the IBJ includes the ROP (run of the press) and a Focus section dedicated to covering current trends and issues in a particular industry. A Small Business Section is published in the last issue of each month. This section targets the special needs and interests of small business owners.

There are also several IBJ magazines, promotional magazines, and IBJ Supplements. IBJ is a "pass along publication." Total circulation figures (paid and non-paid) are 17,647, with an average of 3.6 readers per copy. The total readership is 63,529.



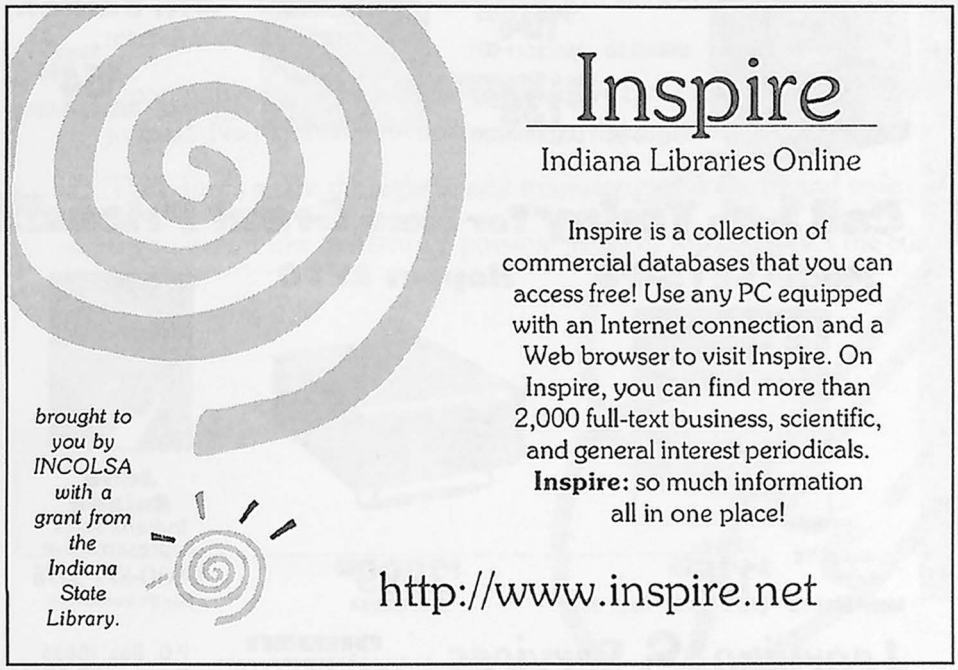
Inspire goes to the movies with Silver Screen Media!

About Silver Screen Media...

Silver Screen Media provides movie theater audiences with a source of entertainment preceding each feature film. The presentation is full-color, full-screen, graphically designed slides.

Major advantages of in-theater slide advertising – Ability to reach people on the weekend when most decisions to try new things are made, Ability to target desired audiences, Low cost per thousand, Incredible number of weekly exposures – one 10-screen theater will deliver the message more than 1,000 times per week, Low production cost, Image of "glamour" associated with the movies, Opportunity to be creative with campaigns.

Each ad runs three times before every showing, in all screens at the theaters purchased, 7 days a week. The message can be the same each time it runs, or each slide may be different. The Indiana Library Federation investigated the idea of using video segments rather than static slides with Silver Screen Media. This option was unavailable to the Federation.



Inspire advertisment in the IBJ Fax Daily

IBJ Daily is delivered via fax and e-mail between 1:00 p.m. and 4:00 p.m. every work day, Monday through Friday to approximately 3,288 business executives, who either subscribe to IBJ and request IBJ Daily or pay $24.95 a year to receive IBJ Daily. IBJ Daily is also available on Indianapolis Business Journal's Web site, www.ibj.com. There is an average of 3,801 hits to IBJ Daily on the IBJ Web site each month.

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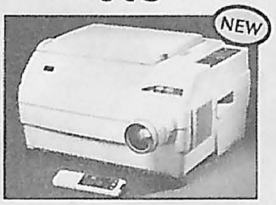

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   b. Microsoft Word (preferred), Wordperfect, or plain ASCII text file (IBM-compatible) attached to an E-mail message addressed to both sschlag@iupui.edu and twhitehd@doe.state.in.us.
2. References or endnotes should appear at the end of the manuscript; footnotes should not be used. Manuscript should conform to MLA style (Gibaldi, Joseph. MLA Handbook for Writers of Research Papers. 4th ed. New York: Modern Language Association, 1995.) Pages should be unnumbered.
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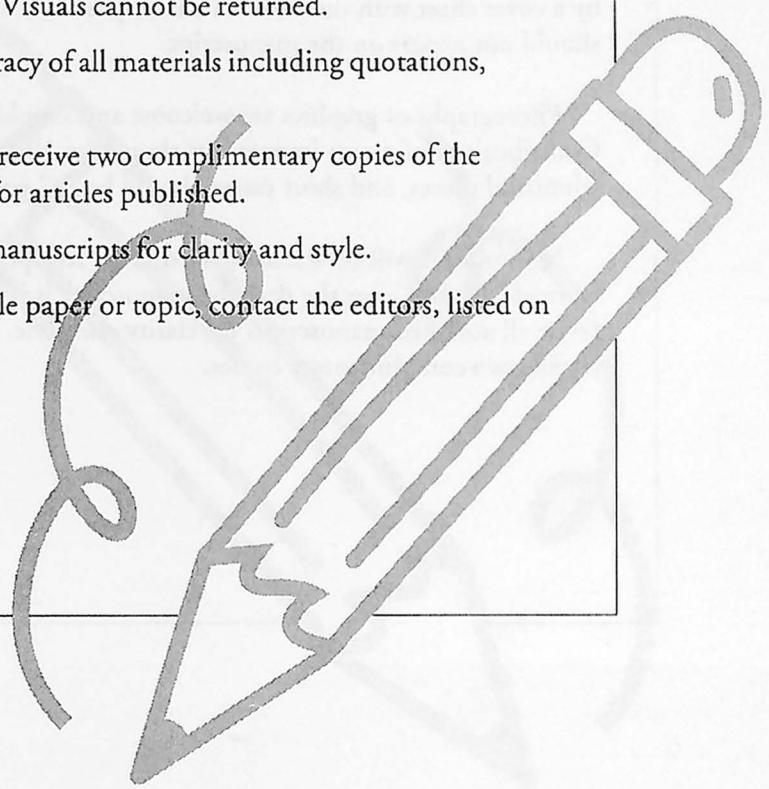

Indiana Libraries

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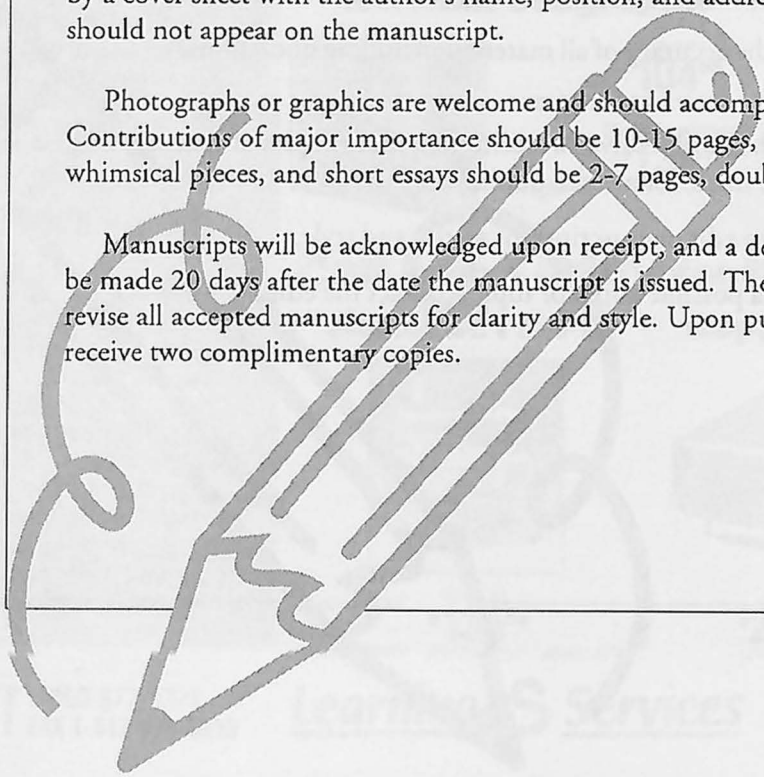

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