SHARED INFORMATION ONLINE: THE LINCOLNET†

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ABSTRACT

The electronic bulletin board (EBB) is a new dimension of online information retrieval services. It refers, in general, to the posting of notices electronically on a microcomputer. Online information retrieval services became commercially available in the early 1970's, but public access to the EBB developed only recently. The paper is intended to introduce the development of the EBB as a part of online information retrieval; the increased use of the EBB with particular reference to Rosary's experience with Lincolnet, a state-funded EBB Project; and the protocols and procedure for using Lincolnet and the telecommunication programs. It briefly mentions, too, downloading and uploading. Also discussed are the advantages and problems of using the EBB.

Since April 9, 1986, Rosary College Graduate School of Library and Information Science has been a part of Lincolnet, an electronic bulletin boards system (BBS), offered for public access by the Suburban Library System and the Maywood Public Library in Illinois. Posting notices for public access via telephones is a new dimension of access to machine readable records. Only since 1985, has the term "electronic bulletin boards" been used as a subject heading in the Library Literature. This paper is intended


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to discuss briefly the development of electronic bulletin boards as an extended service of online information retrieval; microcomputer-generated bulletin boards, and their increasing use with particular reference to Rosary's experience with Lincolnet; the protocols and procedures for using Lincolnet; and the problems of using the system.

The use of computers to retrieve information was developed in the late 1960s and early 1970s. OCLC (Online Computer Library Center, formerly Ohio College Library Center) and later RLIN (Research Libraries Information Network, formerly BALLOTS which stood for Bibliographic Automation of Large Library Operation Using a Time-Sharing System) are two well-known databases providing online access. The emergence of DIALOG, SDC's ORBIT (System Development Corporation's Online Retrieval of Bibliographic Information Time-shared), BRS (Bibliographic Retrieval Services) and many other online retrieval databases with interactive and Boolean operator capabilities has made online use more convenient and efficient. Users may use free-text or controlled-vocabulary searching, logical and positional operators, and other qualifiers to retrieve information for large recall or for precise results.

The availability of online retrieval service and its fast growth are due to three technical developments: (1) large capacity computers with disk storage for time-sharing at a low cost, (2) software for machine readable databases and interactive capability, and (3) telecommunication to link the terminals of users in many locations with a single computer. Users of online services were primarily from the commercial, university, and federal government sectors in the beginning. Nowadays, all sectors, including public libraries, schools, and private individuals, are using such services.

Practically, any type of information can be stored and searched online. Some yellow pages are accessible online via telephones. Users may search with a terminal over 470,000 manufacturing
firms. Auctions can be conducted through remote control, and shopping can be done over a keyboard. The electronic bulletin board becomes another form of online services. Its availability on mainframe computers began in the late 1970s. The two representative information utilities, The Source and CompuServe, provide a variety of online services, including correspondence, games, private files, and bulletin boards. For instance, The Source provides scores of categories for listing notices, ranging from antiques to travel, with main interest in microcomputers, such as Apple, Atari, Commodore and many others.\(^3\) CompuServe provides the National Bulletin Board, a classified section with notices on buying, selling and others topics.\(^4\) Users may retrieve, post, and send information via telephones.\(^5\)

The electronic bulletin board functions like the traditional bulletin board except that it transmits information electronically. In a broad sense, any system to display messages in a computer is an electronic bulletin board. All online information service vendors, such as DIALOG and BRS, are displaying messages. For the purpose of this paper, the electronic bulletin board refers to a database for posting notices via a microcomputer. Electronic mail also transmits information electronically, yet it differs from the electronic bulletin board in that in electronic mail, information is sent to and received by specified recipients, whereas in the electronic bulletin board, information is sent and received by an indefinite number of recipients.

The first known electronic bulletin board on a microcomputer for public access, called INFOPORT, was operated in 1981, in Ontario, Canada.\(^6\) In the same year, Chicago Public Library's North-Pulaski Branch began to provide an electronic bulletin board service, claimed to be the first of its kind in the United States.\(^7\) Electronic bulletin boards have gained momentum. The Louisville Free Library reports that its electronic bulletin board, called FREEBOARD, received 3,000 calls in the first four months.
Microcomputer users may have access to the system which operates from 5 p.m. to 9 a.m. Monday-Friday, and all day Saturday and Sunday.8

The increasing use of electronic bulletin boards is primarily due to two factors. First, the plummeting cost of microcomputers makes their use more affordable. According to Quality Education Data, nearly 80,000 schools in the United States have at least one microcomputer and are increasingly using modems.9 Market Data Retrieval reports that there are more than 1.3 million microcomputers currently used in schools, and that number could increase by 400,000 in 1986.10 It also reports that 86 percent of all high schools, 77 percent of all junior high schools, and 61 percent of all grade schools have at least one computer.11 It is estimated that 50 to 80 million people will purchase home computers this decade.12

The second factor is the availability of many electronic bulletin board programs. Bulletin Board Systems lists fifty BBS software packages, and Dewey gives a listing of thirteen BBS vendors.13 In addition, the development of more friendly software programs, such as gateway and front-end programs, makes access to machine readable records easier.14 The gateway program serves as an interface between the user and the computer, performing connecting functions for the user, such as dialing a telephone number and exercising the access protocols. The frontend program provides more sophisticated functions in that it can perform the search process for the user.

In selecting an electronic bulletin board, the characteristics of the software program and the hardware requirements should be considered.15 In general, there are at least ten factors to look at when selecting a package:

1. Ease of use, including the length of time to learn the package, brief and unambiguous commands, direct search of subrecords, and easily understood messages.
2. Retrieval result, such as the capability of changing format for hard-copy printing.
3. Cost of the package. This includes the cost of a backup copy of the package, and the cost of later upgraded versions.
4. Upgrading features — whether the program will be periodically upgraded for enhancement.
5. Package specifications, such as hardware compatibility, memory space required, and the use of a calendar/clock module.
6. Documentation. It is highly desirable to have good documentation detailing the use of the package.
7. Error messages capability. The package should be able to display error messages if the user hits a wrong key or sends a wrong command.
8. Security requirements. These will guard against unauthorized access to the system.
9. Interactive capability, enabling the user to retrieve information from the system and also to send information to it.
10. Support service, such as a maintenance charge and the availability of a local dealer or agent for demonstration, training, or consultation.

LincolnNet, which Rosary joined, was based on the successful experience at the North-Pulaski Branch Library mentioned earlier. The North-Pulaski Branch Library is receiving approximately 1,000 calls per month for information on its electronic bulletin board. LincolnNet was installed in 1986, with an LSCA (Library Services and Construction Act) Grant to serve the entire Suburban Library System in Illinois. As mentioned in the proposal for the Grant, objectives for installing such a system are:

1. Increase public awareness of library services.
2. Enhance the library's image.
3. Provide another approach to publicity (as encouraged in *Avenues to Excellence*).

4. Enable the library to reach a fast-growing segment of society.

5. Enable the library to be considered a part of the growing trend of microcomputers and modern methods of communication in society.

The Lincolnet system uses one Apple IIe with 10 megabyte disk drives equipped with a Hayes modem. It operates in a 300 baud mode. The software package is the *People's Message System*, a menu search program. To have access to the Lincolnet system, the user may use either a terminal set up in full-duplex with no parity, or a microcomputer with a modem on the same setting. It is easy to use; anyone who is familiar with using a microcomputer can use the service without further training. It is expected that a user must have some basic knowledge of using a microcomputer, such as turning on the power, inserting the disk, awaiting a prompt sign to enter any command and pressing the Carriage Return key after completing the instructions.

To logon Lincolnet, dial a local telephone number and place the telephone handset on the modem, after a high-pitched tone is received. Press Carriage Return twice, and the system is connected. Connection to Lincoln is automatic, if a microcomputer with gateway software is used.

After logon, the system displays information in three categories: (1) Welcome message to use the system, (2) News message from the system, and (3) Instructions on using the system. The last category consists of twelve instructions represented by a character, a character and a number, or a symbol. For instance, the symbol "?" is used to request a menu of commands. The basic instructions are reproduced as follows:

**TYPE “F8” for into on getting a logon ID in order to be able**
to leave messages.
TYPE "F9" for a listing of Info-Mat
Magazine Topics
TYPE <S> to pause
-space bar to continue.

TYPE <K> if you don't want to read the
rest of a message or other
text.
TYPE <N> for System News, User ID
info, general system operation
& normal hours, etc., etc.
Be sure to read this if you
are new here, and check it
regularly for updates.
TYPE <F> for features/articles menu.
TYPE <F2> for a menu of articles from
the BBS Press Service.
TYPE <NEWCALL> if your first call.
TYPE <H> for help.
NOTE: There is a 45 minute time limit
for each call.
TYPE <G> for goodbye — PLEASE DO NOT EXIT
BY SIMPLY HANGING UP OR RESET.
BEFORE asking for a LOGON ID, read
System News.
TYPE <?> for a menu of commands.
>> TYPE <B> to repeat these bulletins. <<

To view the complete menu of features, equivalent to the
table of contents of a book, the user simply types "F". The
following message will be displayed:

Command $f

=================================
 Master Menu of Features
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Below are submenus for Lincolnet. Type the code on the LEFT side for the menu relating to that topic. "MI" returns you to the Master Index "F" will return to the Master Menu (this is the Master Menu)

<table>
<thead>
<tr>
<th>Type</th>
<th>This</th>
<th>To read or view this</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td></td>
<td>Master Menu (this menu)</td>
</tr>
<tr>
<td>R</td>
<td></td>
<td>Read a Message</td>
</tr>
<tr>
<td>E</td>
<td></td>
<td>Enter a Message</td>
</tr>
<tr>
<td>LINCOLN</td>
<td></td>
<td>All About Lincolnet</td>
</tr>
<tr>
<td>PHONE</td>
<td></td>
<td>Phone books from 49 states</td>
</tr>
<tr>
<td>ILLINET</td>
<td></td>
<td>The Illinet System for interlibrary cooperation</td>
</tr>
<tr>
<td>JOBHUNT</td>
<td></td>
<td>Job Hunting Help List</td>
</tr>
<tr>
<td>MI</td>
<td></td>
<td>Master Index of all features</td>
</tr>
<tr>
<td>ROSARY</td>
<td></td>
<td>Rosary School of Library &amp; Information Science</td>
</tr>
<tr>
<td>F2</td>
<td></td>
<td>Info-Mat Magazine (updated weekly)</td>
</tr>
<tr>
<td>F3</td>
<td></td>
<td>General Columns and Articles</td>
</tr>
<tr>
<td>F4</td>
<td></td>
<td>Libraries &amp; Library Services</td>
</tr>
<tr>
<td>F5</td>
<td></td>
<td>Books</td>
</tr>
</tbody>
</table>
F6 = Downloads (free programs for your Apple)
F8 = How to get a logon ID
F9 = BBS Listings, Computer Clubs and other related topics
F10 = Educational Opportunities
F11 = Sources of Health Tips
F12 = From the Reference Center

Take Rosary, for example. To view information about Rosary, type ROSARY. A menu for selection is displayed:

Commam $rosary
Format for printer (y/n) $n

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Rosary College
School of Library and Information Science
7900 W. Division
River Forest, IL 60305
312-366-2490

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Call the School of Library and Information Science if you wish to Share information or have questions. Thank you.

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“F” will return you to the Master Menu
“MI” will return to the Master Index

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Type
This     To read this

RCE     = Continuing Education for
         Librarians
RJob1    = Academic Library Positions
RJob2    = Public Library Positions
RJob3    = School Library Positions
RJob4    = Special & Part Time Positions
RSched   = Rosary School of Library &
            Information Science
            Schedule of Classes

Thanks for calling Linconnet!
Support your local library!

The Rosary record in Linconnet consists of six sub-records; each sub-record is assigned a file name, such as RJOBI for Academic Library Positions. These records are updated frequently. Information on job vacancies is revised every two weeks. If the user is interested in viewing the job vacancies in the academic library field, the just types RJOBI. Current job vacancies in the field of academic libraries will be displayed.

For logoff, simply type G for good-by and a Carriage Return, the system will display COMMENT(S)/SUGGESTIONS: and, after a few seconds, PRESS <RETURN> KEY ALONE AT THE PROMPT. The user may give his comments or suggestions to the system, or press a Carriage Return to disconnect.

Messages may be downloaded and uploaded. The terms, "downloading” or “uploading”, refer to transmission of information from a remote system to home memory, or vice versa. Many communication software programs are able to do this. The
communication software, **Smartcom II**, produced by Hayes, is used as an example. When **Smartcom** operates, the following menu will be displayed:

2. Edit Set              * Send File     8. Select Remote Access (OFF)
A,B - Change Drive

Press F2 For Help

Enter Selection: 1  
Press F1 To Return On-Line

Select 1 to begin communication and then enter 0 for originate. **Smartcom** will display twenty-six different communication options, as shown below.

2. Edit Set              * Send File     8. Select Remote Access (OFF)
A,B - Change Drive

Press F2 for Help

Enter Selection: 1  
0 (originate, A (answer, D (ata:0
Enter Label: Y  
Phone Number: 393430100

**Communication Directory:**

A – CompuServe Direct    \ J – OAG EE Telenet    \ S – CompuServe Datapac
B – CompuServe Telenet    \ K – OAG EE Tymnet    \ T – DJN/R Datapac
C – CompuServe Tymnet    \ L – OAG EE UNINET    \ U – KNOWLEDGE INDEX Data
D – DJN/R Telenet        \ M – THE SOURCE Direct \ V – OAG EE Datapac
E – DJN/R Tymnet         \ N – THE SOURCE Telenet \ W – THE SOURCE Datapac
F – DJN/R UNINET         \ O – THE SOURCE UNINET \ X – Test Set
G – KNOWLEDGE INDEX Tel  \ P – telenet         \ Y – Remote Access
H – KNOWLEDGE INDEX Tym  \ Q – tymnet          \ Z – Standard Values
I – MCI Mail             \ R – Concordia
Each option is represented by a letter. For instance, P is for TELENET, and Y for Remote Access. Press the key Y, and Smartcom will automatically dial the telephone number previously entered on the disk and connect with Lincolnet. At the bottom of the screen, five keys are listed:

Menu: F1  Print: F3  Disk: F4  Macro: F5  Break: F6

Press the F4 key for downloading. Smartcom is ready for downloading by responding with A:TEMP, that is a temporary file in Drive A. From now on, information retrieved from the system is downloaded. Press F1 to complete downloading. Smartcom will respond with NAME FILE RECEIVED: A: and ask the user to give a file name. After the file name is entered, Smartcom responds with RECEIVE COMPLETE XX LINES and returns to the search mode. All information downloaded is now stored on the disk under the file name just assigned.

After downloading, the user may use a post-processor to edit and reformat the information retrieved. Although there are software programs developed especially for downloading and post-processing, such as Biblio-Link and Professional Bibliographic System (PBS), general purpose word processing packages are sufficient to do this. Some word processing packages, however, require text conversion. Radio Shack’s SuperScrripsit, for example, to edit or reformat information downloaded with Videotex Plus, requires converting the ASCII (American Standard Code for Information Interchange) text to work-processing text. The use of WordStar, a word-processing program, is much simpler. The user can directly retrieve, by file name for processing, the file downloaded by Smartcom; no conversion is necessary.

For uploading information to Lincolnet, two steps are required. First, enter G for goodbye and wait for the system to respond with PRESS <RETURN> KEY ALONE AT THE
PROMPT, as mentioned earlier in the logoff procedure. Second, use **Smartcom** for uploading by pressing F1 for menu as shown below and then entering section 5 and 2 for STOP/START consecutively.

<table>
<thead>
<tr>
<th>Smartcom II</th>
<th>Hayes Microcomputer Products, Inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Begin Communication</td>
<td>4. Receive File</td>
</tr>
<tr>
<td>2. Edit Set</td>
<td>5. Send File</td>
</tr>
<tr>
<td>3. Select File Command</td>
<td>7. Change Printer Status (ON)</td>
</tr>
<tr>
<td>A,B – Change Drive</td>
<td>8. Select Remote Access (OFF)</td>
</tr>
<tr>
<td></td>
<td>9. Display Disk Directory (OFF)</td>
</tr>
<tr>
<td></td>
<td>0. End Communication/Program</td>
</tr>
</tbody>
</table>

Press F2 For Help

Enter Selection: 5
Select Protocol: 2
Enter File Name: 00000000000000

When **Smartcom** requests ENTER FILE NAME, enter a file name. Information in home memory under the file name will be transmitted to the system.

Access to electronic bulletin boards has most of the features of an online information retrieval system. Its speed and variety of transmitting features surpass the method of manual searching. The downloading of information proves to be cost effective and efficient. It is faster than typing and virtually no proof-reading is needed. In a manual search for information, the search must be conducted in a place where the materials are located. In online information retrieval there is no such geographical limitation. Through the use of the terminal or the microcomputer with a modem via telephone, the user may have access to many records on in printed form that are not available locally. Nor is there any time restriction for access. BBS can be accessed twenty-four hours a day. In addition, public access to microcomputer electronic bulletin boards is usually free.

There are, however, problems in using electronic bulletin
boards. First of all, in spite of the increasing use of microcomputers, not every family can afford to have one equipped with a modem for remote connection. Until terminals or microcomputers become as popular as telephones, the number of users of electronic bulletin boards will be limited.

Second, although searching with a menu is easy in that the user simply follows the displayed instructions to take the next step, it involves repeated steps, and lacks the flexibility and volatility of free-text searching. In most databases for online information retrieval, records are divided by fields or paragraphs, and most fields or paragraphs are searchable. Field search capabilities do not exist in microcomputer-generated BBS. Again, free-text searching, that is any word in the text can be used as a subject for searching, is not available in microcomputer BBS.

Connecting with an online information retrieval system is commonly done by dialaccess. The user dials a telephone number to connect the system either directly or through a telecommunications network, such as TELENET, TYMNET, or UNINET. To connect with Lincolnet, however, one uses only direct dial-access. Its use is obviously limited to callers with the same area code, because the cost would be prohibitive if connection were long-distance.

Perhaps, the most serious weakness of BBS on microcomputers is the lack of time-sharing capacity, that is it is limited to one user at a time. Lincolnet has to limit each use to 45 minutes to ensure wide public access, yet during the 45 minutes that someone is using it, no one else can have access to it.

Information in the Lincolnet system comes from a variety of sources: libraries, newspapers, magazines, institutions, publishers, and users themselves. Rosary is perhaps the first library school to let people electronically share in its information on continuing education, class schedules, and job vacancies. To collect information on a variety of subjects and to share it electronically with
anyone who has access, is another form of cooperation in the dissemination of information. The user may view the information or get a hard copy of it anywhere, practically twenty-four hours a day, and in a few seconds. As technology advances, BBS will play an important role in expanding and promoting library services.

REFERENCES

1. For the development of online information retrieval, see Tzechung Li, An Introduction to Online Searching (1985), pp. 3-11.
2. Ibid., p. 6.
11. Ibid.
14. For a review of front end software, refer to Donald T. Hawkins and Louise R. Levy., “Front End Software for Online


17. Ibid.


21. UNINET will be phased out and replaced by TELENET as a result of merger. See *Information Intelligence*, 4 (6-7) (June 1966): 13.