

A Flexible, User-friendly Front End for Bibliographic Retrieval:⁸⁸
Making CAN/OLE easier to use

by

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Abstract

We present a new, user-friendly front end for online bibliographic information retrieval. Three levels of interaction are provided: a menu-driven mode to guide and instruct beginners; a command language mode for more experienced users; and a transparent mode in which users may communicate directly with the retrieval system in its own query language. Users may change modes at any time: all three may be employed in the same search session. The programs are readily portable not only to other microcomputers but also to other retrieval systems.

With ever growing numbers of untrained people wishing to use information retrieval systems there is an urgent need to make these systems more user-friendly. The most common form of assistance is a software package on a microcomputer which mediates between the untrained user and the retrieval system. These interface programs, which provide instruction and guidance, translate search statements made in ordinary English into the arcane commands used by the retrieval system. A number of such front end retrieval packages have appeared on the market in the past year, but they all have a common failing. The problem with them is that the user tends to be locked into a fairly rigid mode of interaction. Existing front ends seem designed for a user with a fixed set of skills; in general they cannot accommodate the diverse learning styles of different users. Furthermore, front ends often limit the number of system features to which the user has access. While a front end can never increase the functionality of a system, it can simplify the use of some of the more arcane commands which might otherwise lie beyond the user's "threshold of frustration". Our aim is to provide users with flexible interaction which is able to accommodate their diverse learning styles. At the same time we wish to allow them access to the full range of retrieval system features.

2 Problems with CAN/OLE

The retrieval system that we have chosen for our study, CAN/OLE, is one which does not yet have a front end available for it. CAN/OLE, developed at the Canadian Institute for Scientific and Technical Information (CISTI) in Ottawa, is one of the most frequently used retrieval systems in Canada. Its twenty-eight databases contain important information, much of it unavailable through other means. Unfortunately, CAN/OLE's major drawback is that it cannot easily be searched by casual users. Its query language is particularly difficult to learn, and little online help is provided. The following examples demonstrate some of the problems faced by novice users.

2.1 Limited online help.

What little assistance is available assumes previous knowledge of the system. A good deal of intuition is also required. The following transcription illustrates what happens when a user logs in and requests assistance using standard "help", "explain", or "?" commands. (Text to the right of the "@" is typed by the user.)

ENTER PASSWORD

#####

TASKID=0504 POOLID=TSSNRC01 09:41 05/29/84

CANADA INSTITUTE FOR SCIENTIFIC AND TECHNICAL INFORMATION

CAN/OLE WORKSHOPS IN TORONTO IN JUNE. TYPE ? TORONTO FOR MORE INFORMATION.

*****MAY 24, 1984*****

ELIAS HAS BEEN REFORMATTED AND UPDATED TO APRIL 1984. TYPE ? ELIAS FOR MORE INFORMATION.

@ ?

THERE IS NO EXPLANATION AVAILABLE FOR YOUR LAST MESSAGE
@ help

CANCELLED. 'HELP' IS AN INVALID COMMAND
@ explain

USE "?" COMMAND

@ ? command

MESSAGE 'COMMAND' NOT FOUND

@ ? explain

MESSAGE 'EXPLAIN' NOT FOUND

@ ? ? THE SYNTAX OF A SPECIFIC COMMAND, THE EXPLANATION OF A STANDARD PROGRAM MESSAGE, OR SIMPLY GENERAL INFORMATION MAY BE OBTAINED BY ENTERING THE "EXPLAIN" COMMAND, ENTERED AS ?.

***NOTE: WHEN A ? IS USED ALONE, AN EXPLANATION OF THE LAST PROGRAM MESSAGE WILL BE GIVEN.

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It is evident that little joy is obtained with "help", "explain" or "?". "HELP" is not even a valid command! A single question mark is used to obtain a more detailed explanation of the last system message. However, here, a single "?" does not give any additional information because in this case no messages have been sent by the retrieval system. Users must somehow divine that they must type "? ?" in order to obtain a help menu.

2.2 Awkward command language.

Once users have discovered how to obtain help from the system, their next problem is likely to be with the CAN/OLE command language. Because of a somewhat awkward structure, CAN/OLE commands are difficult to remember and formulate. For example, in order to search for references in which the words "INFORMATION" and "RETRIEVAL" occur (though not necessarily together), the user must type:

```
S (INFORMATION,RETRIEVAL),,AND
```

Notice that the logic operator "AND" which links the terms in this search statement appears, somewhat surprisingly, at the end of the line. Another surprise is the two commas following the search terms. They are place holders, which denote an unused "index" field. This index field is used, for example, when looking for items containing the words "information" and "retrieval" in the title, as follows:

```
S (INFORMATION,RETRIEVAL),T,AND
```

For a novice, "S (INFORMATION AND RETRIEVAL)" would seem to be a more natural way of expressing the idea, and one which would more easily be remembered.

Phrase searching is another cumbersome operation in CAN/OLE. To find documents which contain the phrase "information retrieval" involves a three-step operation. Users must first search the terms individually, combine them with "AND", and then use the "SELECT" command:

```
S (INFORMATION,RETRIEVAL)
```

```
AND 1,2
```

```
SELECT 3,'INFORMATION RETRIEVAL'
```

(The numbers refer to the sets created by searching and combining the terms "information" and "retrieval")

Because a relatively simple operation such as this requires several steps, it makes the system quite daunting to novice searchers.

CAN/OLE's complexity stems from the fact that it evolved from an in-house retrieval system. It was designed for users who would be trained to adapt to it. After the following section which summarizes the existing front ends, we will describe our system which makes CAN/OLE's information available to untrained users.

Several front end programs which allow end users to do their own searching have appeared in the market in the past year. Some of them provide all the information which users need, right at their fingertips, thereby eliminating the need for the bulky reference manuals which accompany most retrieval systems. Assistance is provided when signing on to the system, and even when developing a search strategy. Extra features, for downloading and storing retrieved records are sometimes included, making these front end packages attractive to experienced as well as novice searchers.

Some of the better known front end programs are: SCI-MATE, Knowledge-Index, BRS/AFTER DARK, INSEARCH, and SEARCH HELPER. These are summarized in Table 1. The Institute for Scientific Information (ISI) markets SCIMATE, one of the oldest commercially available front end programs, which provides access to DIALOG, BRS, MEDLINE, as well as the databases on ISI. SCI-MATE also provides a database management program which allows users to maintain their own files of references. However, its menu-driven searching software is cumbersome, requiring users to select logic terms "AND", "OR", "NOT", from a menu instead of simply typing them. It also requires users to remember the vendor file numbers and acronyms for the databases accessed!

Dialog's "Knowledge-Index" and BRS's "AFTER DARK" are front ends attached to the retrieval system itself; the user's microcomputer merely functions as a "dumb" terminal. Both services are available at rates much lower than those of conventional search services. Both are available on a range of microcomputers. There are disadvantages, however, to providing help at the remote computer: help is not available until the user is connected to the service; no assistance is provided for the sometimes complicated task of logging on. Also, the vendor may limit the number of features available. Furthermore, while it is possible for an individual to modify a front end program which is located in the user's microcomputer, this is impossible with host-resident front ends.

INSEARCH, developed by Menlo Corporation, and SEARCH HELPER, marketed by Information Access Corporation (IAC), are the newest and most promising additions to the growing body of software for the inexperienced searcher. Both programs use windowing techniques and menu screens to provide users with information. INSEARCH also comes with a tutorial program on a separate diskette. Menlo Corporation is planning to provide updates to its programs to keep abreast with changes to the DIALOG system. IAC's SEARCH HELPER provides access to its own databases and to the Management Contents database on DIALOG. The program minimizes search costs by helping users to formulate their queries before logging on. Once users have selected their search terms, the program connects to the database, carries out the search, and logs off.

Since most of these programs have become available within the past two years it is too early to judge their commercial success. Online searching is expensive and time consuming: connect time can cost more than sixty dollars an hour. Successful searching requires that the user be familiar both with the database being searched, and with the retrieval system. For these reasons, searching is often carried out by trained intermediaries. Even with the increase in availability of terminals, and the cheap easy-to-use software, a certain amount of skill is required to search successfully. To encourage end users to do their own searching, a front end program must be easy to use, and yet powerful enough to supply the precision needed to select specific records from a large database.

4 The CANSEARCH Front End

Our experimental interface designed for CAN/OLE is written in PASCAL and runs on an

APPLE IIe microcomputer. The interface program incorporates both a menu system and an easy-to-use query language, and provides online help.

4.1 The interface query language.

As with most retrieval systems, CAN/OLE provides many more commands than most users will ever employ. Twenty-two of the forty-two commands on CAN/OLE are for saving and editing search strategies. Only seven commands are supplied by the experimental interface; however, these seven commands perform the functions of ten CAN/OLE commands. The interface query language allows users to perform the following basic operations: selecting a database, examining database vocabulary, searching to retrieve references, and displaying retrieved records. The following commands are provided at the interface:

- CHOOSE - to connect to a database;
- BROWSE - to examine database vocabulary;
- SEARCH - to look for information;
- DISPLAY - to display retrieved citations online;
- PRINT - to order an offline printout from CISTI;
- REVIEW - to display sets created in the search;
- HELP - for assistance;
- LOGOFF - to quit.

The query language may be used in either the menu mode or the command language mode. In the menu mode, users type the command name, or its first letter abbreviation, and press the RETURN key. They are prompted for the information required to complete the command. While menus are a good means of introducing a query language to the novice, they soon become tedious and time consuming. A command language is a more flexible mode of interaction preferred by experienced users. The experimental CAN/OLE interface program differs from other front end programs in that it allows users to switch easily back and forth between menu and command language. Users enter the command language mode simply by entering the command name, and all the information needed to execute the command, on one line. Users who forget a command may return to the menu mode by typing the command name and pressing RETURN.

With most front ends the query language of the host system is invisible to the user. With our experimental interface, the program translates each command into the CAN/OLE query language, and displays this translated form on the screen before sending it to CAN/OLE. In this way, users become familiar with the host's query language as they work. In the "transparent" mode, which is available at any time, users may send individual commands directly to CAN/OLE in its own query language by prefixing them with a "#".

4.2 Online help

Menus and brief explanations of the commands are available online. To see a menu, users merely press the RETURN key. Users who type "HELP" receive assistance with what they are doing. Explanations of commands are illustrated with examples. If a user requests help for the search command, the following is displayed:

SEARCH to retrieve information.

Use single words (or phrases of up to 3 words) to specify the topic of the documents you wish to retrieve. The topic may be SEARCHed in one or more of the database indices. (The title index is searched if no other index is specified. Indicate other indexes by their first letter.) You may use AND, OR, NOT to link words, and brackets to indicate the order in which words are to be searched. For example, you might try the following (type what's between the quotes):

ENTER SEARCH TOPIC: "microcomputers and games/t"
(t is for title index) to find documents on games for microcomputers.

The program helps with logging on. Users need know only their account numbers and passwords. From then on, the program provides step-by-step guidance and instruction.

4.3 A sample search session.

The following is a transcript from a search carried out in CISTI's own catalogue for references to articles on "home computers". The user begins searching by choosing a database from a database menu supplied by the program. Help and guidance have been incorporated into the user/computer dialogue. (Only what is to the right of the ":" or "@" is typed by the user.)

<i>LABEL</i>	<i>DATABASE</i>
ELIAS	Environmental Libraries Automated System
GEOREF	Geological Reference File
ICAR	Inventory of Canadian Agricultural Research
IEC	Directory of Federally Supported Research in Universities
INIS	International Nuclear Information Service
INSP	INSPEC (Physics, Electrical and Electronics, Computer and Control Abs.)
MICROLOG	Canadian Government Documents
NRIS	National Research Information Service
NTIS	National Technical Information Service
OON	CISTI's Catalogue
OONL	CAN/MARC
OOT	Canadian Transportation Documentation System
SPORT	Sport Database
UNION	Union List of Scientific Serials in Canadian Libraries

ENTER LABEL [press RETURN to GO BACK; press DELETE to CANCEL]: oon
CAN/OLE COMMAND >> ENQUIRE OON

.....
You are now entering the OON database.
Use the SEARCH command to retrieve documents from OON.
Wait for the @ prompt before typing.
Press RETURN for a complete list of available commands.
.....

OLEXXXXXX 07/04/84 20:39
\$0.04 0.001 HRS OLE

COPYRIGHT CISTI CURRENT CATALOGUE.
CATALOGUED FROM 1978-JUNE 26/84
@ <RETURN>

.....
type: SEARCH (to retrieve documents.)
BROWSE (to examine an index.)

CHOOSE (to select another database.)
LOGOFF (to quit.)

.....HELP@or@?@for@assistance.....

@ search <RETURN>

ENTER SEARCH TOPIC: (home or personal) and (comput* or micro* or mini*)
<RETURN>

CAN/OLE COMMAND >>S (HOME,PERSONAL,COMPUT*,MICRO*,MINI*); OR 1,2;
OR 3,4,5; AND 6,7

8 new sets have been created for a total of 8 sets.

NOTE: To see set contents, type DISPLAY.

<i>set</i>	<i>items</i>	<i>set description</i>
001	427	SEARCH HOME, TITLE
002	215	SEARCH PERSONAL, TITLE
003	6,454	SEARCH COMPUT*, TITLE
004	6,601	SEARCH MICRO*, TITLE
005	1,699	SEARCH MINI*, TITLE
006	638	OR 001,002
007	14,151	OR 003,004,005
008	91	AND 006,007

@ display <RETURN>

SET NUMBER [type set number; press RETURN for LAST SET]: <RETURN>

ITEM NUMBER [type item numbers; press RETURN for ALL]: <RETURN>

FORMAT [Short, Medium, Long; press RETURN for Long]: short <RETURN>

CAN/OLE COMMAND>> P ,(A,T)

NOTE: Press ESC followed by RETURN to STOP DISPLAYING.

8/1

TI - A FILE TRANSFER PROGRAM FOR A PERSONAL COMPUTER.

AU - => WRIGHT, KARL D.

8/2

TI - THE IBM PERSONAL COMPUTER FROM THE INSIDE OUT.

AU - => SARGENT, MURRAY.; SHOEMAKER, RICHARD L.

8/3

TI - => SPECIAL ISSUE ON PERSONAL COMPUTERS.

<ESC> <RETURN>

5 Conclusions

We have demonstrated that it is possible to produce an interface program that is easy to use, flexible enough to accommodate diverse learning styles, and powerful enough to provide access to the full range of retrieval system features. The program is written in a high level language, PASCAL, making it easy to modify and maintain. Because the commands provided at the interface allow users to perform all the basic search functions (choosing a database, retrieving and examining references) the program is readily generalizable to other retrieval systems.

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TABLE 1: FRONT END PROGRAMS FOR BIBLIOGRAPHIC RETRIEVAL SYSTEMS COMPARED

FEATURES	FRONT ENDS						Experimental CAN/OLE Interface
	Sci-Mate	Knowledge-Index	BRS/After Dark	Insearch	Search Helper	CAN/OLE	
Host Retrieval System	DIALOG, BRS, ISI, NLM, SDC	a few DIALOG databases	a few BRS databases	DIALOG	IAC databases	CAN/OLE	
Target User Group	inexperienced & experienced	inexperienced	inexperienced	inexperienced & experienced	inexperienced	inexperienced & experienced	
Query Format	menu	command language	menu	menu	menu	menu and/or command language	
Ability to Use Host Query Language	yes	no	no	limited	limited	yes	
Ease of Use	medium to difficult	easy	very easy	medium to difficult	very easy	very easy	
Communications Features	auto-dial, automatic logon	none	none	auto-dial, automatic logon	auto-dial, automatic logon	auto-dial, automatic logon	
Additional Features	- Database Management System			-online tutorial - database descriptions on disk			
Online Help User's Manual	yes yes	yes yes	yes yes	yes yes	yes yes	yes yes	
Front End Computer	- Apple II, II+, IIE - IBM PC - TRS-80	most micros	most micros	- IBM PC or compatible - T.I. Professional Computer	- Apple II, II+, IIE - Eagle IIE - IBM PC or XT	- Apple II+, IIE	