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RQ, 1989, Volume 28, Issue 4, Pages 506-516
ISSN: 0033-7072
http://www.rusq.org/
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Mediated searching on end-user systems: an inexpensive online resource.

By Melvon Ankeny

While BRS/After Dark and Dialog's Knowledge Index were developed for the end-user market, their attractive pricing structures, system refinements, and increasing selection of databases make them possible considerations as initial or adjunct systems for mediated search programs. Although it is assumed that mediated searching of these systems on a ready-reference basis is being done in libraries utilizing them as end-user services, there is rare mention in the literature of their employment as major components of standard mediated search services. This article details the 3.5 years' experience using BRS/After Dark and Knowledge Index as the main systems of choice in a mediated search service of a department library on a large academic campus. It also considers the after-hours services from the intermediary's point of view, noting the major trade-offs made in choosing to search them in lieu of their parent (BRS and Dialog) services.

The development of online search systems for the end user makes available some core databases at comparatively low cost. When BRS/After Dark and Dialog's Knowledge Index were officially announced in 1982, articles and advertisements began to appear in popular publications targeting the "at-home or at-work self-service online market." (1) Reviews in library literature followed soon after. 2 Initial evaluations noted the limited number of databases available (BRS/After Dark began with eight databases and Knowledge Index with ten); difficulties with the menu-driven system on BRS/AD and the command structure of both systems; and general criticisms regarding the diminished search capabilities of the offshoots when compared to the more powerful features of the parent systems.

There is some indication in the literature that the end-user market at which these services aimed has not materialized as expected-modem sales and active end users are lagging behind expectations. (3) The end-user products have found a home in many libraries, so "what was designed to bypass the Library has become a valuable asset and service in the Library itself." (4) Continuing additions to the literature document programs that facilitate access and train end users to perform their own searches on personal or library-owned equipment. In a 1987 RQ article, Alice C. Lettlejohn (5) cites much of the literature reporting on end-user programs in academic libraries, from Janke's 1983 report (6) to the 1986 SPEC Kit on end-user searching services.' What is unclear however, is the extent that these services are being used as traditional mediated services. Reviews of both Knowledge Index' and BRS/AD' have indicated their viability either as costeffective services for traditional readyreference or as a means of instituting a library search service. Jordan and Bernhardt reported on the successful advent of an online searching program at two campuses of Northern Virginia Community College that initially relied on Knowledge Index and BRS/AD." Related reports, such as the Ensor and Curtis article on Search Helper that detailed its use as a mediated service offered at the reference desk of the California State University-Long Beach Library, indicate that enduser services are being used in

traditional mediated circumstances albeit sometimes as interim steps to their employment as full end-user services. (11) Otherwise, there has been little written concerning their practical use for mediated searching.

A MEDIATED ONLINE SERVICE

The Business Library at Ohio State University initiated an online search service in February 1984, the result of a decision to decentralize online services previously operated out of a single location in the university libraries. The decentralization effort coincided with the Business Library's acquisition of an IBM XT and with personnel changes that provided professional staffing for some evening hours. One of the decisions was to include both BRS/AD and Knowledge Index as options for mediated searching-options in addition to access to the full services of BRS, Dialog, Dow-Jones News Service, and the more specialized services of I. P. Sharp.

Online services had not been marketed to patrons of the Business Library on any regular basis, and the inexpensive price structure of the after-hours services was seen as a valuable element in efforts to introduce and promote usage of online searching. The Business Library is adjacent to the College of Business, which had an enrollment in 1987 of 3,868: 3,2 75 undergraduates, 380 M.B.A. students, 183 students in the Public Administration graduate program, and 30 doctoral students. While the library wished to offer and promote inexpensive online access, it recognized that staffing and equipment could not be devoted to an actual end-user program at that time. The needs for instruction and counseling of end users, both pre- and post-search, and the necessity for staff monitoring made the use of BRS/AD and Knowledge Index as end-user services an unfeasible proposition. Articles in the literature detailing end-user programs in operation on various campuses document the instruction and monitoring demands. (12)

From February 1984 through July 1987, 1,971 database searches were performed for 1,612 patrons on a readyreference or cost basis in the Business Library's newly initiated mediated search service. As indicated in table 1, the average search cost per database from all vendors was $4.28, with an average per patron cost of $5.21. BRS/AD searches averaged $3.08 per database and $3.78 per patron; Knowledge Index searches averaged $1.91 per database and $2.06 per patron. It is difficult to get an accurate comparison of likely costs for the same searches performed on the parent systems, BRS and Dialog; however, on the basis of the sample search comparisons listed in table 6, the BRS/AD searches in table I would have averaged $13.64 per database and $16.75 per patron on BRS (443% more cosdy), and the Knowledge Index searches would have averaged $12.51 and $13.49 respectively on Dialog (655% more costly). As an additional cost indication with, again, the comparison depending on many variables, Automated Reference Statistics for Ohio State University Libraries for the period July 1986-June 1988 show that the average cost for the Business Library (primarily using BRS/AD and Knowledge Index as vendors) was $3.83 per database search and $4.74 per patron. Statistics for the Main Library, where the majority of online searching on campus is performed (using the full-service vendors), show an average cost of $15.45 per database and $22.04 per patron for the same time period.

TABLE 1*
Vendor Breakdown: February 1984-July 1987

VENDOR	DATABASES	AVG. COST/DATABASE	PATRONS	AVG. COST/PATRON
BRS/AD	1,379	$ 3.08	1,126	$ 3.78
Dialog	208	8.97	122	14.57
KI	163	1.91	151	2.06
CNI	102	2.98	102	2.98
IP Sharp	54	21.79	52	22.63
BRS	39	13.18	36	14.28
DJNS	26	2.70	23	3.05
Totals	1,971	$ 4.28	1,612	$ 5.21

*A database search was counted each time a database was accessed, including reconnects; a patron search was counted each time a different database was accessed.

The great majority of searches were performed on BRS/AD with ABI/INFORM, (table 2,) the database most often searched. ABI/INFORM searches on BRS/AD averaged $3.16 each connect time with a per-patron cost of $3.90. The preponderant choice of this database for 70% of the BRS/AD searches roughly parallels the experience at the Lippincott Library of the Wharton School (University of Pennsylvania). In a 1985 study of an end-user program utilizing BRS/AD, 80% of searches were concentrated in the ABI/INFORM database." An indication of the growth in the Business Library's search service can be seen in table 3. The average number of searched databases grew from ten per month for the first twelve months of service to eighty per month for the last six months of this period. Patrons served grew from an initial average of seven to 61 per month during the same period.

Table 2
BRS/After Dark Knowledge Index Breakdown: February 1984-July 1987

DATABASES*		AVG COST/DATABASE	PATRONS	AVG COST/PATRON
BRS/After Dark				
ABI/INFORM	970	$3.16	786	$ 3.90
BIZZ†	42	3.74	42	3.74
DISS	36	2.84	24	4.27
MGMT	55	1.57	49	1.76
PAIS	58	1.17	55	1.24
PSYC	63	2.55	44	3.66
SSCI	45	9.06	34	11.99
Misc	110	1.80	92	2.16
Knowledge Index				
BUSI1	17	$2.61	12	$3.39
BUSI2	143	1.73	136	1.72
COMP3	1	6.65	1	6.65
COMP4	1	9.45	1	9.45

*See Table 4 for explanation of database codes.
†No longer available on BRS/After Dark

Table 3
Average Searches Per Month

TIME PERIOD	DATABASES	PATRONS
2/84-1/85	10	7
2/85-1/86	50	43
2/86-1/87	64	55
2/87-7/87	80	61

BRS/AFTER DARK AND KNOWLEDGE INDEX SERVICES

Selecting BRS/AD and Knowledge Index as components of the Business Library's online search service depended largely on the databases offered. This must be a major point of consideration for any library assessing their possible use. BRS/ AD currently offers 102 of the 138 databases available on the parent system, including 19 of the 30 that can be characterized as "business" databases (see table 4). Knowledge Index offers 65 of some 300 databases available on Dialog, including only 14 of the "business" databases (roughly 80). As only 2 of Knowledge Index's "business" databases are duplications of those on BRS/AD, however, they add depth to a business-oriented search service by offering such online resources as a standard business directory and important access to the literature of economics and trade journals.

Table 4
BRS/After Dark and Knowledge Index "Business" Darkness

	BRS/AFTER DARK	KNOWLEDGE INDEX
ABI/Inform	X (INFO)	X (BUSI1)
ABI/Inform Practice	X (INFT)	
Abstracts of Working Papers in Econ	X (AWPE)	
Agribusiness U.S.A.		X (AGRI2)
Business Software Database*	X (BSOF)	X (COMP6)
CAB—Econ., Development and Education	X (ECON)	
CAB—Leisure, Recreation and Tourism	X (TOUR)	
Canadian Business and Current Affairs		X (MAGA2)
Chemical Business Newsbase		X (BUSI4)
Consumer Reports		X (REFR6)
Corporate and Industry Research Reports Online Index	X (CIRR)	
Disclosure/Health	X (DSHL)	
Disclosure/History	X (DSCH)	
Disclosure/Online	X (DSCL)	
Disclosure/Spectrum Ownership	X (OWNR)	
Economic Literature Index		X (ECON1)
Federal Register Abstracts	X (FREG)	
Finis: Financial Industry Info.	X (FINI)	
Harvard Business Review	X (HBRO)	X (BUSI3)
Health Industry Research Reports	X (HIRR)	
ICC British Company Directory		X (CORP2)
Investor's Daily	X (INVT)	
Management Contents and Backfile	X (MGMT)	
PATDATA	X (PATS)	
Standard & Poor's Corp. Descriptions		X (CORP3)
Standard & Poor's News		X (CORP1,4)
Standard & Poor's Register—Biog.		X (CORP5)
Standard & Poor's Register—Corp.		X (CORP6)
Trade & Industry Index*	(BIZZ)*	X (BUSI2)
Work/Family Life Database	X (WFLD)	

*No longer available

Other databases pertinent to the Business Library's subject areas (such as PAIS International, PsycINFO, Social SciSearch, Dissertation Abstracts, Magazine Index, National Newspaper Index, and Newsearch), which are available on one or both systems, broaden the subject retrieval capabilities. It should be noted that each of the systems continue to add databases and occasionally discontinue others.

SYSTEM CAPABILITIES

BRS/AD and Knowledge Index are essentially spinoffs of the parent systems (BRS and Dialog). Because they were not developed initially as end-user systems but are reconfigurations of search capabilities, etc., which are available on the parent systems, they tend to be less user-friendly than services developed from the beginning as end-user services. This complicates searching for the end user by requiring knowledge of Boolean logic and particular command structures of each system, and an awareness of the distinct personalities of the different databases available for access. By the same token, the spinoff relationship is to the advantage of the intermediary. Many of the search capabilities available on the parent systems are available on the spinoffs.

For the most part, the manuals for BRS/ AD released in 1984 and 1987 (14) have more completely detailed the capabilities of their system than the Knowledge Index manual released in 1982. (15) Dialog will be releasing a new edition of the Knowledge Index manual in fall 1988, however, and this promises to be a more comprehensive source of information. Each service has a newsletter and an online news feature to alert searchers to changes on their system. The manuals can only hint at the full search capabilities of a database (although the new File database on BRS/AD is an excellent online source of information on databases). The documentation from the database producer can be the most complete source of information. A prime example is the third edition of Search Informpublished in 1986, (16) which does an excellent job of delineating the search capabilities for ABI/INFORM on the various systems available, including BRS/AD and Knowledge Index.

It is also recommended that search manuals and accompanying documentation (database chapters, blue sheets, etc.) for the parent system be available for consultation. Features not presented in the enduser manuals may be available for searching. As examples, BRS/AD supports negative, paragraph qualification and Knowledge Index offers the full range of proximity operators found in Dialog although neither option is presented in the manuals. Arguably some of the niceties of online searching could be considered as complicated and relatively unessential features for an end user while at the same time being useful from the intermediary's point of view.

COMPARISONS

In comparing the basic capabilities of BRS/After Dark and Knowledge Index, Figures 1 and 2, it is apparent that some features are distinctly related to those of the parent system (e. g. , truncation cannot be as fine-tuned on BRS as on Dialog and this is correspondingly true for

the enduser systems). Other capabilities relate to particular features which were or were not retained in the spinoffs.

BRS/AD offers a menu-driven approach, much of which may be bypassed by the experienced user to utilize the command driven mode. Using communication software such as Hayes Smartcom II, it is a simple matter to log on to the system and with a few keystrokes incorporating stacked commands bypass the menus and access the database of choice. Beginning in fall 1988, Knowledge Index also offered a menu-driven option that is bypassed by selecting the command mode from the initial menu.

BRS/AFTER DARK - BASIC SEARCH CAPABILITIES

SEARCH COMMAND At the ENTER SEARCH prompt, type in search statement without a command. EXAMPLE: arbitration.de.

S command will return you to search mode if ENTER SEARCH prompt not given.

LOGICAL OPERATORS AND, OR, NOT

POSITIONAL OR PROXIMITY OPERATORS

(adjacent, in this order) EXAMPLE: quality circles

(adjacency implied, no operator used)

SAME (same paragraph, any word order) " quality same circles

WITH (same sentence, any word order) " quality with circles

TRUNCATION

$ EXAMPLES: woman$, woman$1, woman$2

NESTED LOGIC EXAMPLES: (_____ or _____) and _____

((_____ or _____) and _____) not _____

COMMAND STACKING Separate commands with semi-colon. EXAMPLE: quality circles.de.;pc;l;m;1-10

RANGING Option not available.

LIMITS Option not available.

PARAGRAPH SEARCHING Same options as on BRS, see TABLE 5 for specific example.

BACK REFERENCING Set 1 referred to as 1

MULTIPLE SEARCH TERMS Only final total given for combination of terms within a set.

SORT (typical sort options are by author, title, journal or publication year)

STEM ST (Stem) Access to variant endings of a term in the basic index.

EXAMPLE: st; quality

DISPLAY/PRINT D (Display) or P (Print): online printing, one screen at a time with screen prompts. PC (Print Continous): continous output, no prompts.

Fig. 1. BRS/ After Dark—Basic Search Capabilities

REVIEW R command displays previous search strategy.

CHANGING DATABASES C followed by a semicolon and new database code.

EXAMPLE: c;mgmt (change to Management Contents)

OFF CONTINUE OC (Within same day will reconnect to same database with search intact).

ONLINE ACCOUNTING Date, time, and session number given at end of search. No charges calculated.

PRINT FORMATS

short	Author, title, source
medium	Author, title, source, descriptors
long	Complete record
TI	Title only display
TD	Tailored display of specified paragraphs

COST Database prices range from $8 to $48 per hour. Charges per citations printed range from $.03 to $11.20. Title only display $.02.

HOURS OF AVAILABILITY Weekdays 6 P.M. to 4 A.M.

Saturday and Sunday 6 A.M. to 4 A. M.

ONLINE DOCUMENT ORDERING Option not available.

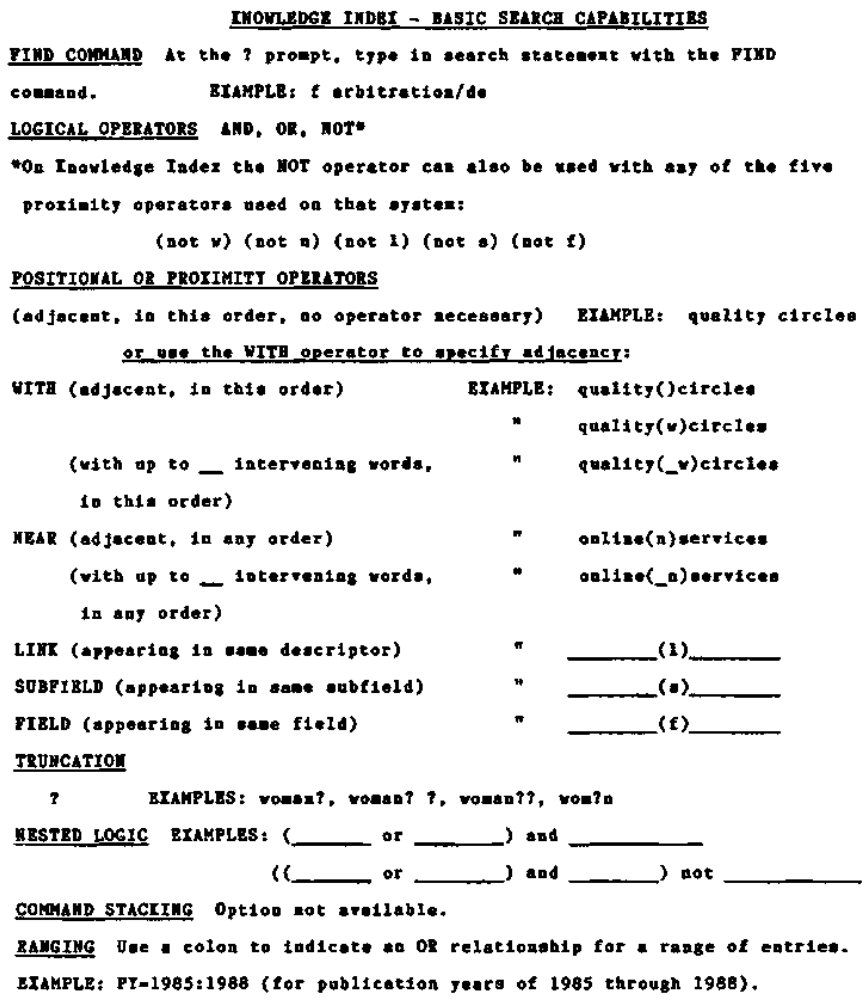
Fig. 1. Continued

Each system has advantages over the other and each has its own distinctive characteristis or "personality" with which a searcher must become familiar for the most efficient use. Simple adjacency is implied on both systems, a simplifying feature for end users although Knowledge Index also allows the use of the with operator and specification of numbers of intervening words. Command stacking on BRS/ After Dark is a useful feature and can be used to advantage in constructing search strategy offline and sending a file on a communication software. On the other hand, the absence of a limit or ranging feature on BRS/AD makes restriction of a search to a particular range of publication dates an awkward operation in contrast to the same operation on Knowledge Index. BRS/AD's short and medium formats are more useful in retrieving cited sources or gauging citation relevance in the course of a search than Knowledge Index's.

The online accounting system on BRS/ AD is not well suited for mediated search purposes. Initial logon includes no statement of time, and final logoff gives only the amount of time spent in the last database accessed. Because charges for each database differ on BRS/After Dark, it is essential to logoff and re-logon the system each time a different database is accessed for an accurate record of search time for charge-back purposes, Number and cost of citations printed also must be computed at the completion of a search. The online accounting system on Knowledge Index efficiently calculates time and charges (based on the uniform price of $24 per hour for all databases with no citation charges) and also allows retrieval of cost statements at any time during a search.

LIMITATIONS

Reviews have noted that the limitations of the after-hours services do not recommend them for the complex search. (17) How ever, for a given database the limitations may be few indeed. The comparison in table 5 of search capabilities by paragraph for ABI/INFORM as offered by BRS, Dialog, and their after-hours counterparts illustrates that the capabilities are identical. The differences may be in the specificity of the search as allowed by truncation, adjacency, or limit features.



KNOWLEDGE INDEX - BASIC SEARCH CAPABILITIES

FIND COMMAND At the ? prompt, type in search statement with the FIND command. EXAMPLE: f arbitration/de

LOGICAL OPERATORS AND, OR, NOT*

*On Knowledge Index the NOT operator can also be used with any of the five proximity operators used on that system:
(not w) (not n) (not l) (not s) (not f)

POSITIONAL OR PROXIMITY OPERATORS

(adjacent, in this order, no operator necessary) EXAMPLE: quality circles

or use the WITH operator to specify adjacency:

WITH (adjacent, in this order)	EXAMPLE:	quality()circles
	"	quality(w)circles
(with up to __ intervening words, in this order)	"	quality(_w)circles
NEAR (adjacent, in any order)	"	online(n)services
(with up to __ intervening words, in any order)	"	online(_n)services
LINK (appearing in same descriptor)	"	_____(l)_____
SUBFIELD (appearing in same subfield)	"	_____(s)_____
FIELD (appearing in same field)	"	_____(f)_____

TRUNCATION

? EXAMPLES: woman?, woman? ?, woman??, wom?n

NESTED LOGIC EXAMPLES: (_____ or _____) and _____

((_____ or _____) and _____) not _____

COMMAND STACKING Option not available.

RANGING Use a colon to indicate an OR relationship for a range of entries.

EXAMPLE: PY=1985:1988 (for publication years of 1985 through 1988).

Fig. 2. Knowledge Index—Basic Search Capabilities

Major limitations of the services are the hours they are available, figures 1 and 2, and the need for evening or weekend staffin to meet that schedule. Either additional staff is required or a reconfiguration of schedules is necessary to accommodate the online access hours. For immediate information needs that cannot be deferred, it is also important to have access to the fuU service vendors. However, in comparison to those mediated searches which are printed offline and require a number of days to receive, the time schedule for information

delivery using the after-hours services may exceed that of the traditional service. It should be noted that the practice of offline printing may be on the wane. Indeed, for downloading to a diskette, there is no offline option. The research of Brian Williams regarding comparative costs for online and offline printing may be an indication that more mediated searches are being printed online because the cost differentials are not that great." However, his cost comparisons are based on the printing of only the bibliographic citations. Because of the cost factor of the online printing time, extensive searches with abstracts will continue to be printed offline.

On BRS/After Dark and Knowledge Index, searches can only be printed online with the information immediately inhouse once the search is performed. However, the unavailability of an offline printing option and the demand on time for online printing which that imposes on a searcher is a factor worth noting. This is an important point because the searcher is more or less tied to the computer terminal untU search results have been completely displayed (while also being printed or downloaded for later printing) and the logoff command entered. The balancing aspect is the comparative cost of the different services. For purposes of comparing time and cost, in table 6 a simple search statement entered on ABI/INFORM at 1200 baud which results in fifty records printed online in long format requires the following amount of online time and cost: BRS/ AD, time: 15 minutes, 7 seconds; cost: $5.85; and Knowledge Index, time: 11 minutes, 44 seconds; cost $4.72. Search time and cost can be cut considerably by searching at 2400 baud if that option is available on the communication software. This reduces search time to 5 minutes, 10 seconds on BRS/AD, cost: $3.24; and 6 minutes, 25 seconds on Knowledge Index, cost: $2.57. In comparison, the online time and costs on the parent systems for searching the identical statement and ordering the citations printed offline in the same format is 50 seconds for BRS, cost: $25.91; and 51 seconds for Dialog, cost: $30.93 . The relatively low cost of the afterhours services has to be balanced against the increased amount of searcher time (and its implied costs) and any cost effects engendered by staffing changes due to shifting of personnel to evening or weekend hours.

CONCLUSIONS

Mediated searches on BRS/AD and Knowledge Index can be marketed to the patrons of the academic library as high quality products at reasonable prices. They make readily available many standard databases which are often underutilized because of the expense involved. As in the use of any reference tool, printed or online, much will depend on the user's knowledge of the tool's features and capabilities. The after-hours services should be considered as an option for any library, whether as an initial step into the offering of online search services or as an addition to services in place.

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