OPAC vs. card catalogue : a comparative study of user behaviour

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Abstract Even though use studies of card catalogue are quite rare, use of OPAC has been extensively investigated since early 1980s. Yet there are not many attempts to conduct comparative studies highlighting the differences in use of card catalogue and OPAC of the same library (i.e., user population). This paper reports an attempt made to study use of OPAC of ISRO Satellite Centre (ISAC) library and compare the results with the findings of the study of use of card catalogue of the same library conducted 17 years ago. The paper not only brings various aspects of user behaviour about OPAC but also depicts the differences in user behaviour as well as the effects of technological changes from card catalogue (manual system) to OPAC (automated system).

Keywords Use of OPAC; Use of card catalogue; User behaviour

1. INTRODUCTION

Despite numerous user studies carried out in the profession, studies on use of card catalogue are very few. So is the case of studies on user visit to libraries and traffic flow pattern within libraries. These studies have to be necessarily based on time consuming and difficult (observation, interview and transaction monitoring/ transaction log analysis) techniques. Eliciting opinion of users about visiting library, using card catalogue or library collection will not yield reliable quality data. Even when users are questioned, critical incident technique may help to improve the quality of such data. Use of card catalogue or even OPAC within library (i.e., unless OPAC is made accessible from outside library premises) is by a subset of user population which visits the library. As such user behaviour as far as library visit and movement within the library are concerned is closely related to the study of use of card catalogue or OPAC.

An observation-based use behaviour study of card catalogue of ISRO Satellite Centre (ISAC) library was carried out during 1985 (Sridhar, 1986). Some significant findings of the study included (i) Non-use of classified catalogue; Negligible use of report number catalogue (which is like classified catalogue for reports); Moderate use of author and title catalogues; Heavy use of subject catalogue (ii) Significantly more use of card catalogue during second half (i.e., afternoon) of the day (iii) Large majority of searches made for the purpose of finding the location of the documents (i.e., to know the call number and report number); Nearly one-fourth of searches made to know the accession number of books and reports to enable manually querying the circulation system about their check out or reservation status and reserve the documents, if needed; About 10% of searches made to retrieve references on a given topic; Hardly 4% used card catalogue to search and find (vaguely/previously) known items.

The library was automated just before 1990 and the OPAC was made available on campus wide LAN with over 100 terminals in 1991. However, due to certain security problems while implementing a new bought out software during 2000 the LAN is temporarily restricted to library premises. These circumstances were considered more reasonable to compare use of OPAC with that of card catalogue of the library. In other words, after a lapse of 17 years, an attempt is made to study the user behaviour about OPAC and compare the results with that of an earlier study of use of card catalogue (1985).

2. SOME PAST STUDIES

Even though the number of studies of card catalogue of libraries are limited, studies on use of OPAC are plenty and there exists good number of reviews of OPAC studies (Larson, 1991; Heldreth, 1985; O`brien, 1994). OPAC appeared in the libraries of developed countries in early 1980s but about 5 to 10 years later in developing countries. The most extensive study of OPAC was by multiple studies instituted by Council on Library Resources (CLR) during 1981-83 covering 16 systems in 29 libraries with about 12000 users and nonusers (Ferguon, et.al. , 1982).

The *first generation* OPACs which emulated the card catalogue approach (online card catalogue models) lacked authority control over name and subject headings. They did not cover some types of materials, portions of books and information about utility and availability of books. The change from the pre-coordinated search of card catalogue to post-coordinated retrieval in OPACs, improved and remote access, varieties of search features, display and user interface, e-mail delivery, holdings of other libraries, current awareness service, circulation information, ordering and processing files, etc., became common in the *second generation* OPAC. Yet the extensive cross references of the traditional card catalogue are missing in OPACs. Further, being an automated system, OPACs penalise users heavily for any error in inputing the query. The interactive, intelligent, diagnostic, natural language based *third generation* OPACs are yet to be widely made operational.

In a 30 months transaction analysis of patron search on OPAC of Ohio State University, Norden and Lawrence (1981) found that (i) use of subject search commands increased rapidly, (ii) title searches were the most frequent (about 1 of every 3), (iii) lower frequency of author search and (iv) the ratio of title to author searches was higher than previously reported (Quoted from Hildreth, 1991, p 262-3). In another study, Mathews, et.al (1983) found that a maximum of 59% make subject or topical search.

Another experimental study by Gouke and Pease (1982) compared use of card catalogue and OPAC at two Ohio State Libraries and surprisingly found that in title search patrons were more successful in finding the targeted record in the card catalogue than in the OPAC. However, most new users of OPAC preferred to stay with it even after learning that searching may be more successful in the card catalogue.

Two most closely and positively linked characteristics for success of search of OPAC are experience with the library and the OPAC, and assistance or training. Further, it was also found that people are not willing to devote much time to learn to use OPAC. Alzofon and Vanpulis (1984) found highest success rate by users having formal training and experience. Half of those using OPAC reported as they would like to check the card catalog if their OPAC search failed.

Most transactions monitoring studies have reported significant frequencies of input unidentifiable by the system, aborted sessions and searches with no matches. Not only "Usage rates are low enough that many online catalog users probably remain `permanent novices' " (Borgman, 1986, p 390) but also users tend to perform simple searches using only the basic features. Like use of other services of library and interactions with library, use of OPAC is also skewed with a few using a lot and most using it little. Further, since most end users search OPAC only occasionally and do not access the system on a regular basis, they tend to learn only enough to do simple searches reasonably quickly and to regard further instructions as unnecessary and more extensive expertise as a burden (Yuan, 1997, p 218).

Lastly, a more recent questionnaire based survey (Oduwole, A A et.al, 2002) of use of OPAC by 286 users at a Nigerian University found that OPAC was used mostly for self search rather than delegated search with author as major (59%) access point followed by subject (30.8 %) and large majority were found very satisfied (75%) with the OPAC.

3. METHODLOGY

The present study (2002) of OPAC use behaviour is also based on observation technique and professional staff have collected data on site by observation and interaction with users at the terminals of OPAC kept in the library. The data collection is done over 80 hours (equivalent of 10 working days or two working weeks) with due representation for all times of the day and all days of the week during July-August 2002. Unfortunately, the software does not provide for collecting transaction log data of OPAC.

It is appropriate to note that the number of users, collection and use of collection have almost doubled over last 17 years ever since the study of use of card catalogue (1985) was conducted. Further, OPAC now (2002) has over 2 lakh records thoroughly edited whereas card catalogue in 1985 provided access to about 25000 documents. The previous study did not cover card catalogues of bound volumes of journals and standards (about 5000 records) as they were incomplete and kept separately. Databases of microfiche reports, standards, internal reports, project reports (of students), non-book materials, bound volumes of journals, and Hindi, Kannada and Government of India rules books are totally new on OPAC. In addition, access to micro documents like database of conference papers has just begun and hence incomplete on OPAC. Table I and Figure 1 depict different databases made available on OPAC at the time of survey along with number of records. As mentioned earlier, due to problems of security and having changed over to bought out software the OPAC is made accessible to users on a LAN within library premises at the time of this study. Even if the campus wide LAN is resumed for OPAC (as web OPAC is expected in mid 2003), comparing the use data of OPAC from outside library premises with use data of card catalogue within the library may not be reasonable.

Take in Table I and Figure 1

4. DATA AND DISCUSSION

The OPAC was used on six user terminals over 80 hours by 410 users. That is, on an average, 41 users have used OPAC of ISAC library on a working day consisting of 8 hours as against 32 users consulting card catalogue in a day as per 1985 study (Sridhar,

1986). Considering the fact that the collection, users and number of records on OPAC have almost doubled over last 17 years, the increased use of OPAC as compared to card catalogue is not impressive. More over, the OPAC use study (2002) has also covered the activities of browsing the new arrivals of library and querying circulation system for checkout/ reservation status of documents or members because of facilities available in the new software. If we remove about one-third of usage for these purposes (see Table V), then the quantum of usage of OPAC on a given day is not even as much as what it was in case of card catalogue. Sadly this supports the criticism that current online catalogues are more difficult to use and less serviceable than card catalogues and they are more used to find known items than to seek information or to solve information based problems (Borgman, 1996, p 494). This being a comparative study with a gap of 17 years, the possibility of change in the composition of user population and changed behaviour of users themselves over the period about use of card catalogue or OPAC, library visit / use and even reading habit are not taken into account by the study. Most importantly, this study has excluded large number of delegated searches made on OPAC by library staff on terminals meant for users as well as other terminals exclusively meant for staff.

Variation in use of OPAC over a week: Table II and Figure 2 depict the data over a working week from Monday to Friday along with average attendance of users in the library at a given point of time in 1985. A non-parametric chi-square test on the table revealed that use of OPAC differed significantly over a week at 95% probability. Interestingly, use of OPAC is maximum on Wednesday (mid of the week) and minimum on Friday and relatively less in the beginning of the week also. This conforms to the findings of earlier studies of user visit to library (Sridhar, 1982 & 1989) and other user interactions with the library (Sridhar, 1988) as well as the study of use of card catalogue (Sridhar, 1986). Figure 2 further indicates that use of OPAC has more varied (during a week) than the number of users present in the library on different days of the week. The degree of variability of in searching OPAC at a University library revealed that subject searching varied from 17% to 64% over the days of the week and from 12 to 70% over weeks of the semester (Kaske, 1988a, 1988b).

Take in Table II and Figure 2

Banks (1999) in her analysis of transactions log found that weekly distribution of searches follow `m-shape' with five distinct phases (initiation, peak , holiday period, another peak and end of semester) with more searches in the beginning of the week and fewer searches in the first and last two weeks of the semester. She concluded that search behaviour is a function of week of the semester as OPAC usage followed the m-shape in another university and predicted that it will follow the pattern in future also. In the analysis of subsequent data she found `m-shape' more flatter than earlier and almost 55% decline in OPAC search due to fall in building traffic. As mentioned earlier, use of card catalogue/OPAC is obviously a function of user visit to library (except in case of remotely accessed OPAC). The present study is not based on transactions log analysis but on sample observations and transaction log data is not available for analysis on weekly basis. The data of Banks is from academic libraries whereas the present study is from a special library. However, surprisingly the pattern of OPAC search during a day (Figure 2) in the present study follows close to a flat m-shape with only single peak.

Variation in use of OPAC during a day : The same data of use of OPAC is presented on two hourly blocks for a typical day in Table III and the distribution over a typical day also

varied significantly at 99% probability as per non-parametric chi-square test. As could be seen from Table III and Figure 3, even the pattern of use of OPAC during a day depicts that use increases during mid of the day but use in the afternoon is quite substantial and probably due to large number of highly volatile and non-member users, namely project trainees, who are allowed to make in-house use of library only in the afternoon. Such large number of trainees were not there at the time of earlier (1985) study of card catalogue. Even then, the average attendance of users as per earlier study was higher in the afternoon. Similar to Figure 2, the trend in Figure 3 reveals that both use of OPAC and card catalogue substantially increased during the mid of the day despite the fact that the number of users present at a time remained almost same throughout the day. The variation in searching OPAC at a University library revealed that subject searching varied from 22% to 74% over the hours of the day (Kaske, 1988a, 1988b).

Take in Table III and Figure 3

Variation in use of OPAC terminals : Table IV, Figures 4 and 4A present distribution of data of use of OPAC on six user terminals of the LAN along with data about lent out use of ISAC library documents in terms of percentage of total items borrowed in a year. Expectedly, in spite of having four terminals located in the books area, 98% of the use is made from these four terminals. Once again, it may be noted that the large number of project-trainees (and even apprentices) who use only books would add substantially to the use of these terminals in books area. Two observations are worth making on Table IV (Figures 4 and 4A). Firstly, this clearly substantiate the general lent out use pattern of library documents that nearly 85% of lent out transactions are for books (lent out use of books, journals and reports for one year are also shown in Table IV and Figure 4A) . Secondly, this data supports the earlier decision to locate additional / more user terminals in the books area itself. Simple statistics coupled with heuristics enable decision on need for additional OPAC terminals even though queuing theory can be applied for the same analysis. A special mention about the trend in Figure 4A may be worth. Use of OPAC on LAN terminal in the journals area is much less than the percentage of lent out use of journals. On the other hand, use of OPAC in books area is much more than the percentage of lent out use of books. It may not be out of context to recall a finding of an earlier study (Sridhar, 1989) of user movement and length of stay in the library that the average time spent by users in journals area is much longer than the time spent in books area despite the fact that journals are quantitatively less used and less number of users visit journals area than books area.

Take in Table IV and Figures 4 and 4A

Purposes of using OPAC : The users were questioned as well as observed for the purposes for which OPAC was used during the survey. The software enables users to search books and other databases (totally 9 databases including journals as shown in Table I), as well as browsing new arrivals of library and querying the circulation system of the library to know the borrowed and reservation status both by member and by document. The data relating to purposes of using OPAC is presented in Table V and Figure 5. It is clear from Table V and Figure 5 that a sizable 65.5% of use of OPAC is to search various databases. Querying the system for circulation information is also a respectable 32.9%. However, searching journals database (both current issues and bound journals) and browsing new arrivals of library are negligible and they are respectively 4.1% and 1.6%.

Take in Table V and Figure 5

Distribution of searches among databases on OPAC : The distribution of number of searches among nine databases (including journals) are presented in Table VI and Figure 6. Expectedly, as many as 88% of searches are executed on database of books (which is the default database of the system). Journals (6.1%) followed by reports (3.7%) and non-book materials (1.2%) databases are searched by a small segment of users. The conference papers database is of very recent origin and hence obviously not searched. However, databases of internal reports and vernacular books are, surprisingly, not searched by any. The project reports of engineering project trainees are limited (500) and they are comfortably browsed on the rack and hence may not require to be searched. Yet 0.9% searches are made on project reports database. It is obvious from Table VI and Figure 6 that other databases (i.e other than books) need to be promoted among users by variety of means including user orientation programmes, flip charts and individual user assistance.

Take in Table V I and Figure 6

Access points/ approach to OPAC and card catalogue : The kind of access users prefer while searching OPAC as well as card catalogue are very interesting and probably more revealing for development of search tools and techniques. The present study based on critical incident observation has primarily aimed at knowing the approaches of users of ISAC library while searching OPAC. Table VII and Figure 7 present the statistics relating to different approaches adopted by users for searching / querying the system. Also juxtaposed in the Table and corresponding Figure 7 is the data from previous study of use of card catalogue of 1985 (Sridhar, 1986). The data reveals that the title approach is adopted by a maximum of 38.3% while using OPAC as against a maximum of 54.2% adopting subject (descriptors) approach in the card catalogue case. It may be noted that additional search features/ approaches like KWIC and combination searches were obviously not found in card catalogue and hence the magnitude of subject search on OPAC can be assumed to be 33% after adding the KWIC and combination searches. Even then the subject searches have substantially dropped from the time of card catalogue to OPAC. In the past, there is generally a small but significant decline in controlled subject searching in favour of keyword (free text) searching (Larson, 1991c). Even the percentage of searches on author catalogue has dropped from 35.4% in card catalogue to 26.8% in OPAC. This also conforms to the findings of Norden, et.al. (1981) that title searches were most frequent and the ratio of title to author searches was higher than that in card catalogue. Assuming that specific item searches are mostly non-subject searches, Hirst (1999) through a questionnaire survey of users with different levels of IT expertise found that OPAC searches were mainly conducted for specific items and that most were successful. Hardly 2.5 % of searches are `combination` searches. These kind of advanced searches are expectedly done by very few end-users and this trend conforms to the findings of most of earlier studies of OPAC.

Take in Table VII and Figure 7

Concentrating only on major approaches, namely title, author and subject and merging KWIC searches into subject searches extracted data is presented as Table VIIA. This table together with Figure 7 relating to title, author and subject searches present an interesting comparison among the studies of OPAC and card catalogue. Firstly, searches by title has substantially increased from mere 8.3 % in card catalogue to 38.3 % in OPAC. Secondly,

subject searches have dropped substantially from 54.2% in case of card catalogue to mere 30.7% (including KWIC searches) in OPAC. However, author approach has marginally dropped (from 35.4% to 26.8%) from card catalogue to OPAC days. The data from the Nigerian Academic library is difficult to explain as it has meager 8% searches made on titles and a whopping 58.7% on authors. In CLR project subject searching constituted the majority (59%) (Mathews, et.al., 1983).

Take in Figure 7A

Searching circulation information : Lastly, the kind of searches made on OPAC of ISAC library for circulation information is presented in Table VIII and Figure 8. The table and Figure reveal that while querying circulation system for checkout and reservation status, nearly 71% have approached by member and 29% by the document. Not much comments can be offered on this aspect except that knowing check outs against a given member is more frequent than check out status of individual documents usually made to reserve them.

Take in Table VIII and Figure 8

5. CONCLUSION

Even though there was a general lack of adequate card catalogue use studies, the appearance of new tool OPAC during last 15 years or so, has attracted many to conduct OPAC use behaviour studies. The revision of traditional assumption of librarianship about so called `standard approaches' was long overdue. The OPAC, as a new search tool, has incidentally enabled bringing suitable changes to the way catalogues are accessed. For example, the database of conference papers in ISAC library provide access by place and name of conference where as place of publication and publisher were of not significant access points in the other databases. However, "…much of search process is the same in card and online catalogs. Online catalogs add a layer of functionality, providing more techniques for searching the same data, but also add a layer of complexity to the process" necessitating end-user to have conceptual and semantic knowledge as well as technical skills (Borgman, 1996, p 459).

Further, the criticism that developing countries have made cataloguing a kind of handicraft art for art sake (Mc Carthy, 1975; Dron, 1984, p 253) is no more true with OPACs. Yet we cannot confidently say that OPACs have overcome the critical allegation that cataloguing has not concentrated on real problems such as avoiding silly subject headings and unsought author headings and lack of reader orientation (German and Hotsingpiller, 1979, p 521). OPAC, like card catalogue, continue to be one of the many means by which users discover bibliographic references of their potential interest (Wilson, 1983) and users continue to directly go to library shelves and contact their colleagues for bibliographic information overlooking catalogues and OPACs

OPAC as an intrinsically rich tool not only incorporates `online circulation' and `new arrivals' information of the library but even capable of providing quick, enhanced and easy access from the work place of the user with several additional search features compared to card catalogue and hence substantially saves the time of user. In this sense the traditional card catalogue is no match to OPAC. Comparing them based on quantitative use without adequate weightage to user convenience, time saved, etc., could be less than acceptable. Yet replacing a traditional tool like card catalogue with modern OPAC does not ensure

proportionate increase in use of OPAC. It appears that use of card catalogue or OPAC depend much on the practice, attitude and behaviour of users rather than technology or tools alone.

One limitation of comparing use of OPAC with use of card catalogue is that the purposes and ways of accessing them have substantially changed from one to another. Despite all facts and observations, there appears to be a hunch that information behaviour, reading habit and use of library in general and consultation of card catalogue or accessing bibliographic data through OPAC have either changed or fallen over last two decades.

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TABLES

Table I Databases on OPAC (2002)

Sl. No.	Databases on OPAC	No. of records
1	Books	37900
2	Reports	129,100
3	Standards @	8,400
4	Non Book Materials	1,400
5	Bound Journals*	21,800
6	Hindi, Kannada & GOI rules books	1,500
7	Internal Reports	3,200
8	Conference papers @	12,000
9	Project reports @	500
Total		215,800
Key: @ new databases; *bound journals under journals menu		

Table II Use of OPAC (2002) over a week

	Use of OPAC(2002)	Av. no. of users at a given time in the library (1985)
Mon	90	11.0
Tue	81	10.7
Wed	105	13.0
Thu	70	10.7
Fri	64	12.2
Total	410	
Note: For use of OPAC, Chi square = 10.060, df = 4, p< 0.05		

Table III Use of OPAC (2002) during a day

	Use of OPAC (2002)		Use of card catalogue (1985)		Av. no. of users at a given time in the library (1985)
	No.	%	No.	%	No
08.45 - 10.45 am	50	12.2	18	18.8	10
10.45 - 12.45 pm	77	18.8	14	14.6	11
12.45 - 02.45 pm	162	39.5	30	31.2	13
02.45 - 04.45 pm	121	29.5	34	35.4	11
Total	410		96		
Note: For use of OPAC: Chi square = 71.122, df = 3, p< 0.1					

Table IV Distribution of use among OPAC terminals

Area / section	No. of terminals	Use	Average use Per terminal	Lent out use of documents in %
Books	4	404	101	84.3
Journals	1	2	2	12.3
Reports	1	4	4	1.2
Total	6	410	68	

Table V Purposes of using OPAC

Searching/ browsing/ querying	No.	%
Databases of books & other documents	302	61.4
Database of journals	20	4.1
Sub total	322	65.5
New Arrivals	8	1.6
Circulation/ lending system for status	162	32.9
Total*	492	100
Key : * Total does not tally to sample (i.e., 410) as more than one type of search option is possible in one session		

Table VI Distribution of searches among databases

Database on OPAC	Searches No.	%
Books	288	87.8
Reports	12	3.7
Non book materials	4	1.2
Standards	1	0.3
Internal Reports	0	0
Hindi, kannada & GOI rules books	0	0
Conference papers	0	0
Project reports (of trainees)	3	0.9
Journals	20	6.1
Total	328	100

Table VII Access points/ approach to OPAC and card catalogue

Access point/ type of catalogue	OPAC (2002)		Card catalogue (1985)	
	No.	**%**	**No.**	**%**
Title	150	38.3	8	8.3
Author	105	26.8	34	35.4
Subject (keyword)	90	23	52	54.2
Class No./ Report No.	5	1.3	2	2.1
Place of publication	1	0.2	NA	NA
Publisher	1	0.2	NA	NA
Word in title (KWIC)	30	7.7	NA	NA
Combination search	10	2.5	NA	NA
Total	392	100	96	100
Key: NA, Not applicable				

Table VIIA Percentage of searches by author, title and subject

Access point/ type of catalogue	OPAC (2002)	Card catalogue (1985)
Title	38.3	8.3
Author	26.8	35.4
Subject (+KWIC)	30.7	54.2

Table VIII Searching OPAC for circulation information

	No.	%
By member (staff no.)	131	70.8
By document (accession no.)	54	29.2
Total	185	100

FIGURES

Figure 1: Databases on OPAC

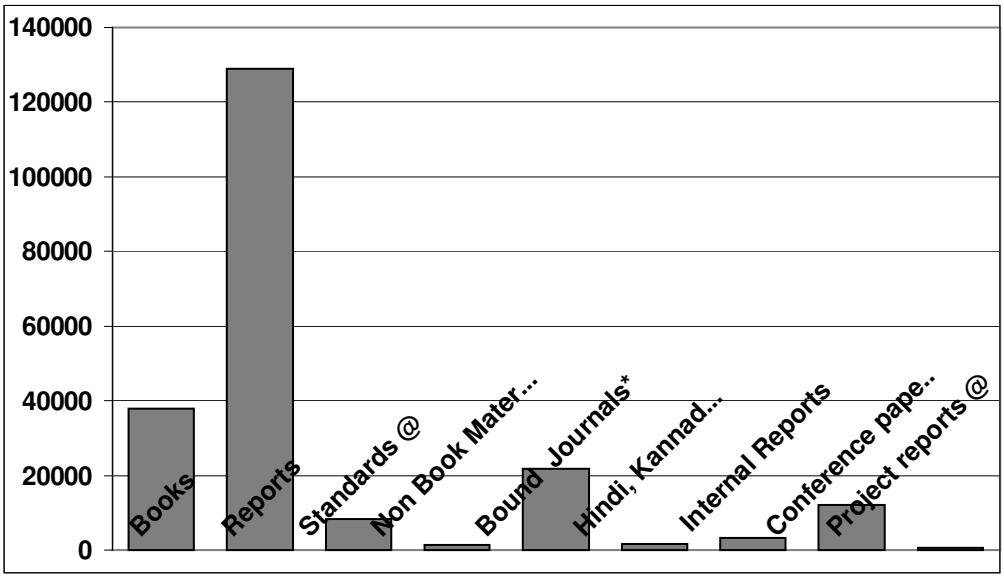


Figure 2: Use of OPAC over a week

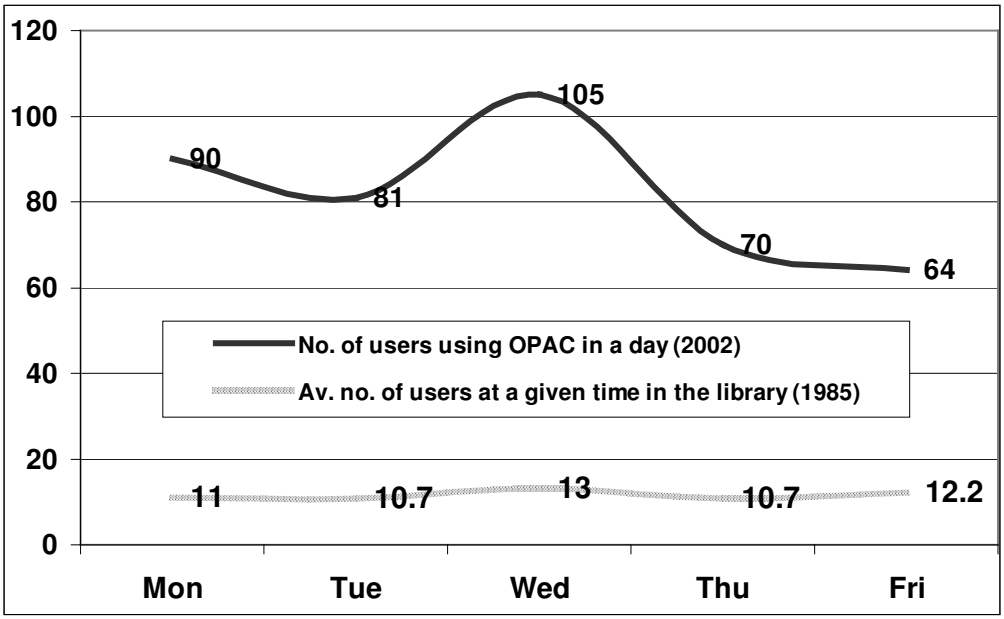


Figure 3: Use of OPAC & card catalogue during a day

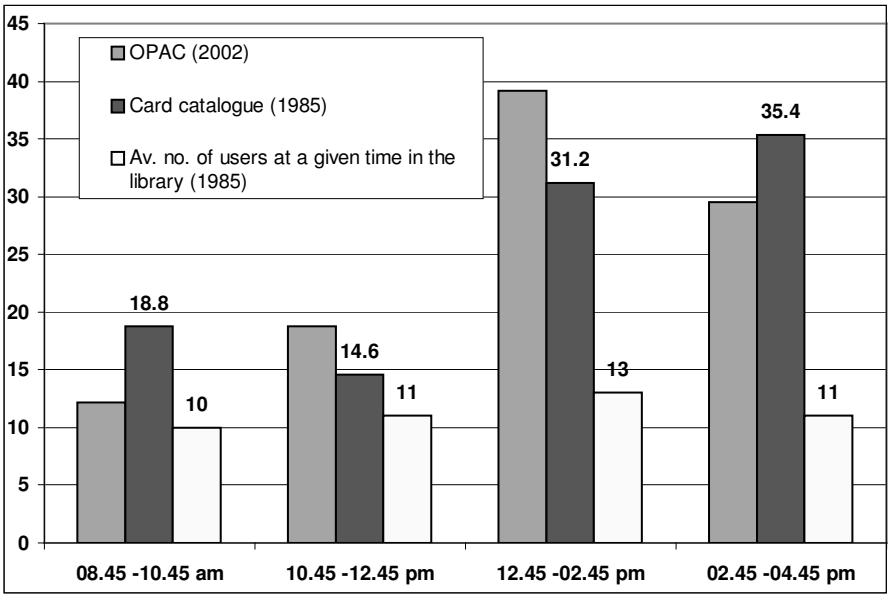


Figure 4: Use of OPAC terminals in different areas

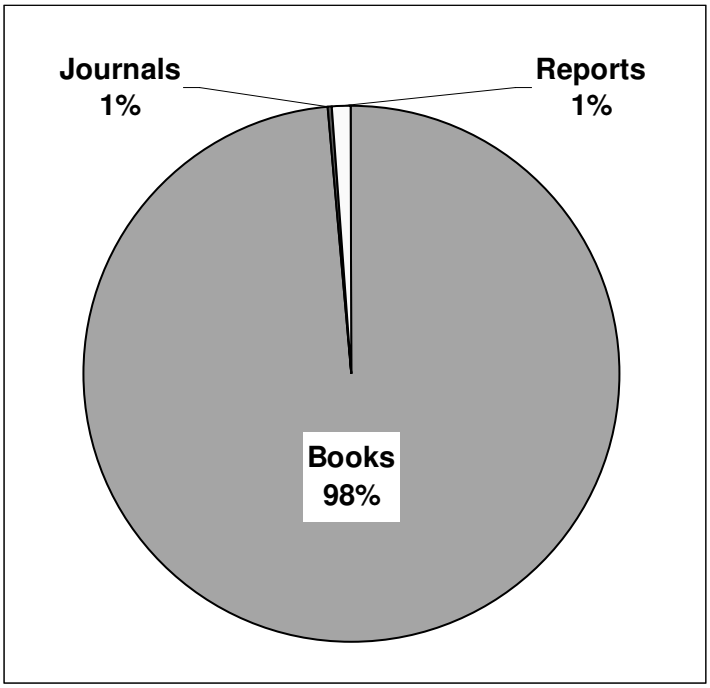


Figure 4A : Use of OPAC terminals vs. borrowed use of documents

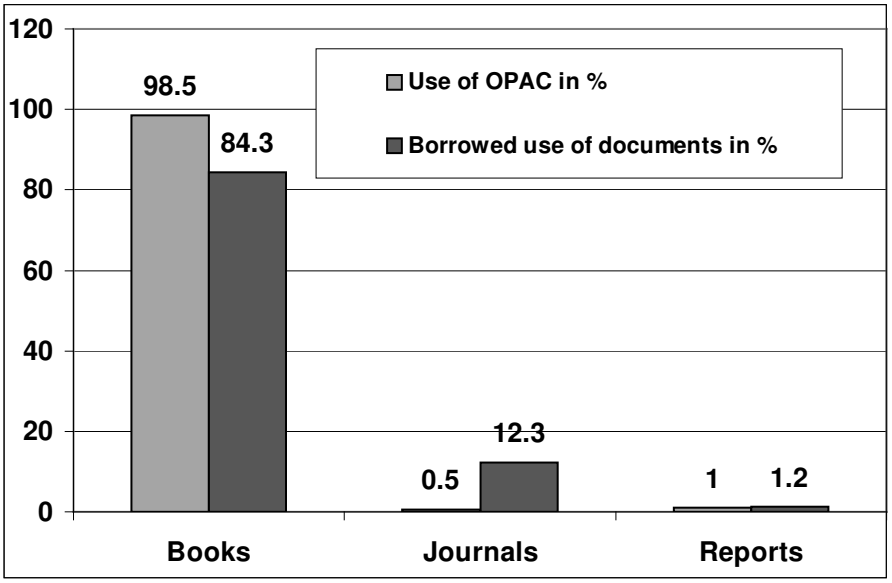


Figure 5 : Purposes of using OPAC

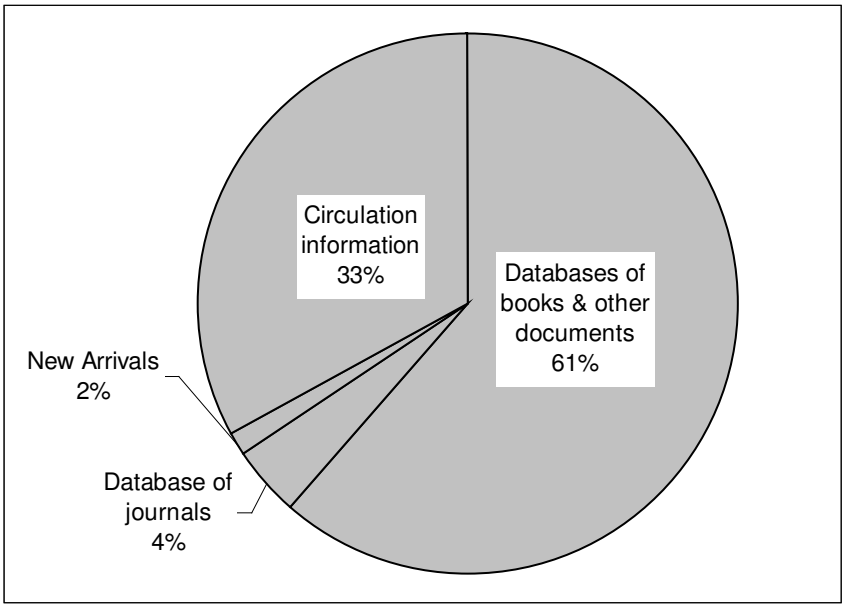


Figure 6 : Distribution of searches among databases on OPAC

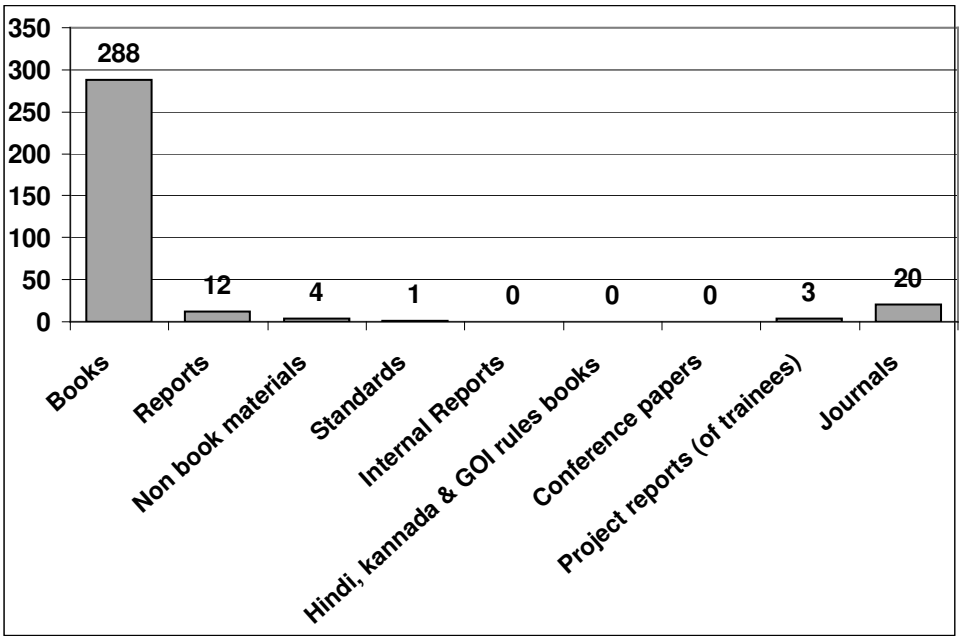


Figure 7 : Access points / approach to OPAC and card catalogue

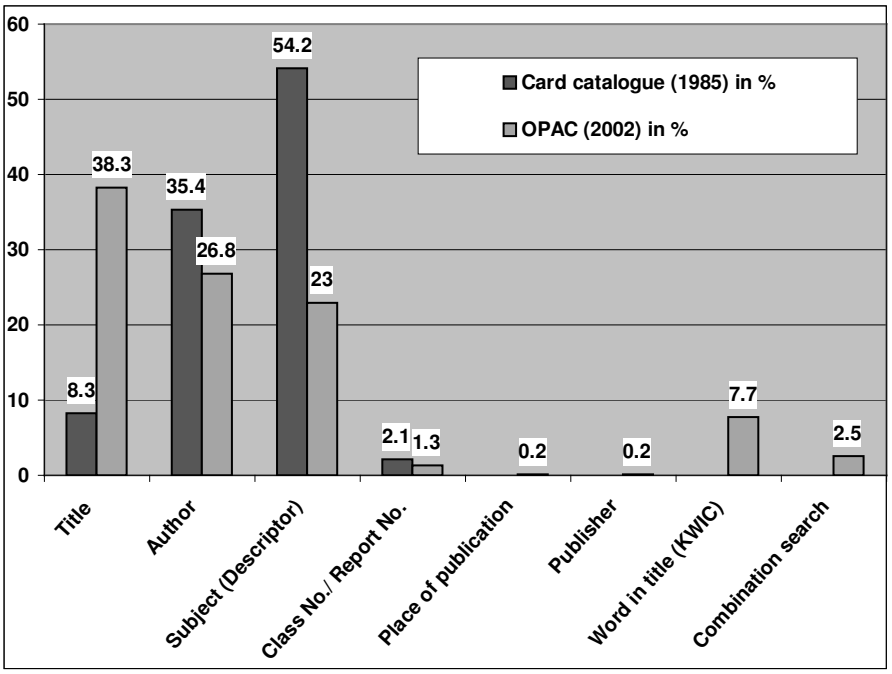
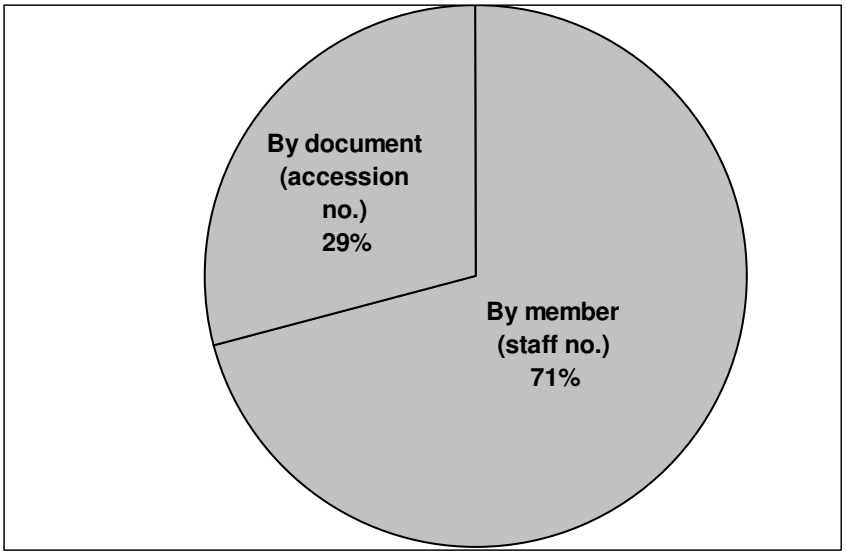


Figure 8 : OPAC searches on circulation system



About the Author

Dr. M.S.Sridhar is a post graduate in mathematics and business management and a doctorate in library and information science. He is in the profession for last 35 years. Since 1978 he is heading the Library and Documentation Division of ISRO Satellite Centre, Bangalore. Earlier he has worked in the libraries of National Aeronautical Laboratory (Bangalore), Indian Institute of Management (Bangalore) and University of Mysore. Dr. Sridhar has published four books ('User research: a review of information-behaviour studies in science and technology', 'Problems of collection development in special libraries', 'Information behaviour of scientists and engineers' and 'Use and user research with twenty case studies') and 74 research papers, written 19 course material for BLIS and MLIS, presented over 22 papers in conferences and seminars, and contributed 5 chapters to books.