CHAPTER 1
INTRODUCTION: PROBLEM AND METHODOLOGY

1.0 Introduction

Information Technology (IT) is revolutionising the way, in which we live, grow and work. It is changing all aspects of our life and lifestyle at large. The constant developments in IT have direct and deep impact on all fields such as education, communication, science, medicine, engineering, railways, banking, entertainment, mass media and industry, where it has created a new world in itself. In this era of IT, the concept of education has also been revolutionised. The computer technology has become almost integrated part of school education, college education, and university education as additional specialised professional qualification. It has also a career choice with large and varied openings into the lucrative and remunerative industry in any field. Consequently, the socio-economic and political structure of our society is changing drastically. Thus, IT has become an important trend of the day.

The library is the centre of learning and storehouse of knowledge. It is the part and parcel of educational institution. The tasks of library are to acquire, collect, process, store, organise, preserve and disseminate the sources of information and to provide them to the users. This process still continues, but with new changes. The sources of the information are increasing in number and a variety of forms and formats. These pose the challenges in providing right information to right user at right time. In such a situation, IT comes to the help of the library. The ways of information collection, process, storage, organisation and dissemination in the library have radically been changed with the implications of IT. In fact, the impact of IT is visible in each and every activity of the library such as acquisition, technical process, circulation, reference service and serial control. It introduces speed, flexibility and control to formerly slow and repetitive procedures. At present, the libraries are including e-books, e-journals, e-reference resources and databases in their collection. They are also introducing Local Area Network (LAN) in order to exchange and share the information. Now, some libraries are becoming members of the networks such as DELNET, INFLIBNET, etc.
Through these networks, resource sharing has become easier. The electronic environment is also producing a cognitive change in the way the users interact with technical devices of the libraries such as library catalogue.

The library catalogue which comprises an integral part of the library has always been viewed as an effective tool to the location of the acquired resources of a library. Among the various forms of the catalogues available in the libraries, the card catalogue has been popular amongst library users for a longer period. At present, the localization of information is no longer conceived without the support of computer. New developments in IT are affecting the libraries and the way users search for knowledge or information. In this context, the catalogues are also no exception.

One of the IT’s greatest accomplishments in the library is the transformation of card catalogue into Online Public Access Catalogue (OPAC). An OPAC is a library catalogue accessed via a computer terminal for the benefit of library users and a computerized catalogue of documents and reading materials available in a library. It facilitates the online access to the library’s catalogue for the users and allows searching and retrieving bibliographic records. It also provides other facilities such as recent arrivals, online reservation, borrower status checking, etc. depending on the underlying library software. OPAC works on many databases, but primarily on the library catalogue database. A catalogue database is the machine-readable form of the card catalogue and made up of a number of bibliographic records. Bibliographic record is a collection of data elements (author, title, publisher, subject heading, etc.) organised in a systematic manner which represents bibliographic items. In other words, OPAC is made up of a simple index of the bibliographic data catalogued in the system. The users interact with an interface, which contains a number of search options (simple search, advanced search, author search, title search, keyword search, subject search and so on) and the other features.

Library software (integrated library system or library information system) is required to make the operations of a library automated including the catalogue. Basically, OPAC acts as an information retrieval system. It is not only an information retrieval system but also a module of an integrated library system. The search and retrieval facilities of OPACs generally vary in different integrated library systems. At

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present, some OPACs also provide the information to the users about a document of the library which is on order, under processing, sent for binding, misplaced or lost, etc. Today, OPAC systems not only serve the purpose of online catalogue but also provide unified or integrated systems covering almost all other library activities such as acquisition system, serial control system, circulation system, financial system, personnel management system and so on. Thus, such library information systems are meant bibliographic information systems for the users and information systems for library management.

OPAC came into existence three decades ago during the late seventies and early eighties. It became popular during the eighties and began to dominate in the field of library catalogue at the end of nineties. Subsequently, the availability of library softwares and OPAC systems increased gradually and encouraged the libraries to introduce the new systems. At present, some libraries are making available their OPACs via campus wide network (LAN) and the Internet called Web-OPACs. OPACs have revolutionized access to bibliographic information through search capabilities such as keyword searching, Boolean searching, truncation, proximity searching and item identity number searching. These were not possible in the earlier traditional catalogue. Thus, they save the time of the users. At the same time, they also add a layer of complexity to this process, due to the hidden nature of bibliographic records.

Since their appearance in the 1970s, OPACs have been source of much discussion, debate and research in the library community. An OPAC is currently seen as more than just the traditional card catalogue. Many library professionals and users now view OPAC as a new vehicle for access to library collection that will extend beyond the conventional catalogue of book. The access to bibliographic databases and even full texts of documents is possible through OPAC. Now OPACs comprise a central element of the integrated library systems and are designed for all kinds of users, ranging novices to experts. However, they are not always very easy to search. Now-a-days, a number of university libraries in India are providing OPAC facility to their users. Therefore, it has become necessary to explore to what extent OPAC has efficiently been utilized by the users in Indian universities.

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1.1 Statement of the problem

For the first time, OPACs appeared in India in early nineties, followed by the Web OPACs at the onset of the 21st century. Some libraries of higher educational institutions initiated to introduce their OPACs. Now the University Grants Commission (UGC) in India, through INFLIBNET is providing funds and technical support for the automation of the libraries. Many libraries are still going through the process of automation including their OPACs in India and the users are also in the process of adopting this new form of the catalogue.

The users often prefer OPACs to the card catalogues due to their search capabilities and speedy access to library collection; they are easy to use as compared to card catalogue despite their shortcomings. OPAC search in the library is associated with immediate localization of desired material. The users go to OPAC only when it is needed, after query they may also like to consult the original document. While most OPACs, in general, place the burden on the users to reformulate and re-enter the searches until they get a satisfactory result. It is generally assumed that they know what they want and can understand the needed information in a form that is acceptable to the computer system and the messages shown by OPACs. But they are often not clear about the complexities such as subject heading, keyword, truncation, Boolean and complex/expert/advanced search, etc. There are some other factors such as the query software, the interface, the system, policy behind indexing and the lack of knowledge on the part of the users. The users are usually not able to formulate their search according to the system’s terminology. When the search provides no output or desired result, in the process they get frustrated or some times abandon the search. OPACs have been a matter of extensive studies. Many studies have been done on OPACs in the developed countries. A few studies are also undertaken in India.

The present research study is intended to know the type of difficulties and problems faced by the users, their needs and the level of satisfaction in using OPAC in the university libraries of Chandigarh and Punjab. This study is, therefore, an attempt to provide useful information to library community as well as to the library software experts for solving the problems faced by the users.

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1.2 Significance of the study

The main objective of the library is to provide quality services to its users and to strive continuously for their improvements. In this regard, the first task of the library is to know about users' needs, problems and their level of satisfaction for better development of library services. Therefore, the findings of this study will help in identifying the areas in which the users face the problems and the areas in which they feel satisfied regarding their needs in using OPAC. It is hoped that the outcome of the study shall also comprise some useful recommendations to the library and information professionals as well as to the library software experts for improving the users' effectiveness of searching OPAC.

1.3 Rationale of the research problem

Now libraries have started to make their operations and services automated using advanced information technology to provide better services to the users. Since, the environment of libraries has been drastically modified; the needs and attitudes of users have also undergone a radical change. Online Public Access Catalogue (OPAC) is one of the services which are being provided in automated libraries. The basic purpose of OPAC is to help the users in identifying and locating their required documents available in a library. Many studies have been conducted in this regard in developed countries which indicate that users often encounter difficulties while using OPAC. Thus, the purpose of OPAC is partially defeated. Today, OPAC has been adopted widely in Indian libraries. It is, therefore, necessary to study the use of OPAC by users from time to time to ascertain their needs and problems in Indian context, so that necessary measures can be adopted for the better utilization of this service. Hence, the present study is very timely and fruitful to examine the use of OPAC in the university libraries of Chandigarh and Punjab, as these libraries are still unexplored for such study.

1.4 Theoretical framework

For the purpose to understand the research problem, the theoretical framework for the study is imperative. In this context, one of the primary functions of library is to make its resources available to its users. Generally, this function depends very much on the quality of the catalogue available in the library. The catalogue is a mirror of library
collection and communicates the information recorded in it about the documents. A library catalogue aids the users in making use of the collection of the library by providing author, title, subject and other approaches to the collection. Basically, the library catalogue reveals to the users the documents of the library and helps them in finding out whether the materials and information of their interest are available in the library or not.

C. A. Cutter in his Rules for a Dictionary Catalogue in 1876 stated the following objectives of the catalogue which are very relevant even today:

1) To enable a person to find a book of which either
   a) the author, or
   b) the title, or
   c) the subject, is known
2) To show what the library has
   d) by a given author
   e) on a given subject
   f) in a given kind of literature
3) To assist in the choice of a book
   g) as to its edition (bibliographically)
   h) as to its character (literary or topical).

Users use bibliographic information to identify, select, and obtain library resources. In this regard, IFLA’s Emerging International Cataloguing Code with Functional Requirement for Bibliographic Records (FRBR) that made the latest attempt to describe a catalogue’s goals and functions in 1998 specified four user tasks: finding, identifying, selecting and obtaining of the desired material.

OPAC, as one of the forms of the catalogue, is nothing but a computer-based replacement of card catalogue and its objectives almost remain the same. However, OPAC is a value-added system, beyond the capabilities of card catalogue and has been introduced to the libraries to provide quick and efficient service to the users. It is an

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important retrieval tool in libraries and facilitates the users in searching and retrieving bibliographic records through several approaches. However, a number of studies have shown that searching in OPAC is problematic. Salton\textsuperscript{6} opined that the formulation of good queries is an art rather than a science; most untrained users are unable to generate effective query statements without assistance from trained searchers. A major obstacle which the users face is unawareness about some of the options offered by the system. They have difficulty in choosing search options when provided with too many options. Sullivan & Seiden\textsuperscript{7} had also expressed the same views. They experience difficulties in conducting effective searches in the Boolean operators (‘AND’, ‘OR’ and ‘NOT’) that is used to construct combination searches. Crawford\textsuperscript{8} stated that it is difficult to remember the complexities of Boolean query construction and retrieval strategies when their knowledge is not put to use on a regular basis.

In known item searches (author or title known to user), they search the items by author, title, subject and keyword and usually give more preference to title and author searches. They can not be relied upon to remember the precise wording of titles and authors. Most frequent causes for author and title search failures are typographical errors and misspellings.\textsuperscript{9} For unknown item searches (author or title unknown to user), the users select subject heading and keyword search options to search their information through OPAC. Subject searching is the type of search presenting most problematic for the users and a number of studies carried out in this regard had also showed the similar results. They are usually not familiar with controlled vocabulary and are, therefore, not able to apply their search strategies according to the list of subject headings such as Library of Congress Subject Headings (LCSH), Sears List, etc. They sometimes make errors in exploring correct search terms. Similarly, keyword search for unknown item searches and even when looking for known item searches is also not free from this problem because the number of documents retrieved is usually too large or too small.


At the same time, they feel difficulties to formulate search strategy to narrow or expand the search. Sometimes typing a search in a wrong field also misleads the users that the document they are looking for is not available in the library.

Library OPAC users are also not of a uniform level, since they come from various backgrounds. Some may bring a considerable expertise to information retrieval tasks in general and in particular to the use of the individual OPAC system at hand. While others may be novices in both the respects.\textsuperscript{10} Now some users are Web-savvy and heavily influenced by trends in Web searching. They expect the library catalogues to function as the search engines like Google, Yahoo, etc.; Novotny\textsuperscript{11} had expressed similar views in his study. They do not try to understand the difference between the underlying structure of OPAC and Internet search engines. The users always value simplicity, speed and ease of use in an online catalogue. At the same time, they clearly lack an accurate understanding of limitations of OPACs and want to spend as little time with catalogue as possible.

OPACs are not self-explanatory. Users often need on-screen help/user assistance to explain the function of OPAC for obtaining the satisfactory search results. In general, on-screen helps provided on the interface of OPAC systems do not yet offer adequate features to properly guide the users in searching them. Due to lack of appropriate instruction and training of the users in some libraries also presents a hindrance in using OPACs effectively.

It is, therefore, apparent that whatsoever may be the reason of search failure, the users think that either the item is not in the library or they are not capable of searching OPAC and sometimes become frustrated and give up the searching process. The information regarding the document of their interest is not revealed to them whether it is available in the library or not. Thus, the objectives of the catalogue are not fulfilled completely due to the above mentioned limitations. In view of these factors, a research study has been conducted to examine the use of OPAC in light of Indian university libraries in general, and the libraries of universities of Chandigarh and Punjab in particular.


1.5 Objectives of the research study

The present research study has been carried out to achieve the following objectives:

1. To study the users’ awareness about OPAC and its search options and other facilities
2. To ascertain the reasons for the most used and the least used search options by the users in searching OPAC.
3. To examine the effectiveness of user assistance/on-screen help on the interface of OPAC.
4. To investigate whether the users need user orientation/education programme and assistance of library staff so as to know how to use OPAC.
5. To find out user needs, difficulties and problems faced by them and their level of satisfaction in using OPAC.

1.6 Hypotheses

The researcher of the present study will test the following hypotheses in order to achieve the above mentioned objectives:

H1: There is no relationship between users’ awareness about OPAC and its use.
H2: There is no relationship between users’ knowledge about how to use OPAC and user orientation/education programme received by them.
H3: There is no relationship between users’ knowledge about OPAC and ease of use of it.
H4: There is no relationship between user-friendly on-screen help available on the search interface of OPAC and ease of use of OPAC.
H5: There is no relationship between users’ level of satisfaction and the problems faced by them while searching OPAC.
H6: There is no relationship between assistance of library staff and use of OPAC satisfactorily.
H7: There is no relationship between users’ level of satisfaction and user friendly OPAC.

1.7 Research questions

The present research study is intended to answer the following research questions:
1. Are the users aware of the existence of OPAC in their library?
2. What is the purpose to use OPAC by the users?
3. How frequently do the users use OPAC?
4. What are the reasons for not using OPAC?
5. Are the users aware of search options of OPAC and other facilities provided there in?
6. What are the reasons for the most used and the least used search options in OPAC?
7. Do the users need user education programme/user training and assistance of library staff for optimum use of OPAC?
8. Is the user assistance/on-screen help on the interface of OPAC effective?
9. Did the users attend any user orientation/education programme on how to use OPAC?
10. Have the users acquired knowledge of using computer?
11. Do the users possess basic skills and knowledge about using OPAC?
12. Are the users influenced by trends of Web searching/Internet search engines?
13. Do the users face the problems/difficulties while using OPAC?
14. When OPAC search provides null retrieval/no output, what the users do?
15. Overall, do the users feel OPAC user-friendly/easy to use?
16. Are the users satisfied while using OPAC?
17. What are the users’ needs to exploit OPAC optimally?
18. What other features would they like to have in OPAC?

1.8 Scope of the study

The present study ascertains the users’ needs, their level of satisfaction, awareness and the problems faced by them while searching OPAC. The study is confined to faculty members, research scholars and postgraduate students of the university libraries of Chandigarh and Punjab.

1.9 Universe of the study

The three universities providing OPAC in Chandigarh and Punjab i.e. Panjab University, Chandigarh, Punjabi University, Patiala and Guru Nanak Dev University, Amritsar, have been selected for the present research study. Faculty members, research scholars and postgraduate students as the members of all these three university libraries of Chandigarh and Punjab comprise the universe of the present study. As per data
collected from the university libraries, there are around 12430 users of different categories in the three university libraries during academic session 2008-2009. The universe of the study has been shown university-wise in Table 1.1.

### Table 1.1
### Universe of the study

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>University</th>
<th>Faculty members</th>
<th>Research scholars</th>
<th>Postgraduate students</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Panjab University, Chandigarh</td>
<td>581</td>
<td>2,011</td>
<td>3,662</td>
<td>6254</td>
</tr>
<tr>
<td>2</td>
<td>Punjabi University, Patiala</td>
<td>627</td>
<td>495</td>
<td>2,242</td>
<td>3364</td>
</tr>
<tr>
<td>3</td>
<td>Guru Nanak Dev University, Amritsar</td>
<td>595</td>
<td>386</td>
<td>1,831</td>
<td>2812</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>1,803</strong></td>
<td><strong>2,892</strong></td>
<td><strong>7,735</strong></td>
<td><strong>12,430</strong></td>
</tr>
</tbody>
</table>

The above table shows that Panjab University, Chandigarh presents 6,254 users of total population. Out of which 581 users are faculty members, 2,011 research scholars and the remaining 3,662 comprise postgraduate students. In Punjabi University, Patiala, out of total 3,364 users, there are 627 Faculty members, 495 research scholars and 2,245 postgraduate students. Guru Nanak Dev University, Amritsar constitutes 2812 users of total population. Out of which, 595 users are faculty members, 386 research scholars and 1,831 postgraduate students.

### 1.10 Research methodology

The survey method of research was adopted to conduct this study. Two comprehensive questionnaires were prepared i.e. one for users and another for reference librarians/concerned library professionals. The first one was to collect the information regarding the users’ perception and satisfaction and the second one for reference librarians/concerned library professionals to ascertain the features of OPACs as well as the questions regarding the status of IT infrastructure and facilities available to support OPAC in the university libraries surveyed. The questionnaire was personally distributed among the users in the university libraries under investigation. Interview and observation methods were also adopted wherever required to make data and information more convincing and authentic. Different categories of users such as faculty members, research scholars and postgraduate students have been covered. Hence, stratified random sampling technique has been used to form a representative
sample of all these categories. The data collected has been analyzed with the aid of SPSS statistical software. There after, the data was interpreted and the conclusion was worked out.

1.11 Sampling

As faculty members, research scholars and postgraduate students of the above three universities in Chandigarh and Punjab were covered for the present research study. “Stratified random sampling technique” was, therefore, applied and a representative sample of approximately 500 users was taken for the three universities. This representative sample has been taken on the basis of a table given by Krejcie & Morgan\textsuperscript{12} for determining sample size. The investigator used “proportionate stratified random sampling” taking approximately 4 per cent of each category of users from each university, as the size of sample is approximately four percent of the universe of the study. The distribution of different categories of users in the various libraries by proportion is shown in Table 1.2.

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|c|}
\hline
Sr. No. & University & Faculty members & Research scholars & Postgraduate students & Total \\
\hline
1 & Panjab University, Chandigarh & 24 & 82 & 146 & 252 \\
2 & Punjabi University, Patiala & 26 & 22 & 88 & 136 \\
3 & Guru Nanak Dev University, Amritsar & 24 & 16 & 72 & 112 \\
\hline
Total & & 74 & 120 & 306 & 500 \\
\hline
\end{tabular}
\caption{Size of sample}
\end{table}

The above table depicts that the representative sample from Panjab University, Chandigarh, is 252 users, out of which there are 24 faculty members, 82 research scholars and 146 postgraduate students. Punjabi University, Patiala presents 136 users of the sample size, of which 24 users are faculty members, 22 research scholars and 88 postgraduate students. Likewise, Guru Nanak Dev University, Amritsar constitutes 112 users of a total sample. There are 24 faculty members, 16 research scholars and 72 postgraduate students. The representative sample taken from various categories of

different university libraries varies because it has been selected on the basis of total strength of the users’ concerned categories and university libraries. Thus, the special care has taken to give representation to each category of users.

1.12 Tools and techniques

As mentioned earlier, two questionnaires were formulated in consultation with the supervisor. One questionnaire for the users covering all aspects of searching OPACs, was drafted and another questionnaire for reference librarians/concerned library professionals to assess the characteristics of OPACs as well as the facilities available to support it in various university libraries. The questionnaires were aimed at to collect the data. Every possible effort was made to obtain the data from a representative sample of the respondents.

1.13 Limitations

Due to certain limitations, it was not possible for the researcher to cover all university libraries in India. Hence, the present study is limited to the universities of Chandigarh and Punjab. There are two universities in Punjab i.e. Punjab Technical University, Jalandhar and Baba Farid University for Health Sciences, Faridkot which do not provide OPAC service, have been kept out of the purview of the study. The Punjab Agriculture University, Ludhiana has OPAC facility, it has also been kept out of the purview of the present study because it is established for specific discipline and therefore, the user needs in this university shall also be specific. Further, there is difference in the features of OPACs of library softwares under investigation so the results obtained of the present study from different OPACs may not be hundred per cent comparable to some extent.

1.14 Chapterisation

The present research work has been described in the following seven chapters:

**Chapter 1: Introduction: Problem and Methodology**

This chapter introduces the topic of research. It states the statement of problem, its rationale, and significance. It further covers theoretical framework, objectives of the study, hypotheses, research questions, scope of the study, research methodology adopted, universe of the study, sampling, tools and techniques and limitations along with outlines of chapters of the thesis.
Chapter 2: Review of the literature

The second chapter provides a comprehensive review of related studies on the topic already carried out earlier. A survey of the literature has been conducted to ascertain what work already done related to the research problem and to find out the gaps in the knowledge existing therein. It has been described in chronological order highlighting the major findings.

Chapter 3: OPAC: its historical development and general features

This chapter introduces the concept of library catalogue. It covers historical development, forms and functions of catalogue. The concept of OPAC and its historical development is also included. There are certain variations in the features of different library softwares. Hence, general features of OPACs have been given in this chapter.

Chapter 4: Profiles of the universities and their libraries under study in Chandigarh and Punjab

The fourth chapter comprises the description of the three universities in Punjab and Chandigarh. It also provides the profiles of their libraries and the data collected from libraries about IT infrastructure and other facilities available for supporting OPAC with interpretations.

Chapter 5: Overview of the library softwares with the features of their OPACs under study

It provides the overview of various library softwares of different university libraries under study. It presents the data related to available search options and features of OPACs of different library softwares.

Chapter 6: Data analysis and interpretation

The sixth chapter depicts the data obtained from the users of the three university libraries regarding various aspects of OPAC. It presents the analysis of data and interpretation of the findings. In this chapter, the hypotheses visualized in Chapter 1 have also been tested.

Chapter 7: Summary of main findings, suggestions, conclusion and recommendations for further research

This is the last chapter of the thesis. It includes the summary of research findings, conclusion and the viable suggestions of the present study. The areas and the possibilities for the further research on the topic are also recommended here.
Bibliography

A comprehensive list of bibliography has been furnished at the end of the thesis. This includes the various sources of information consulted for the completion of the present study.

Appendices

The questionnaires prepared and used for the present study for collecting the data are appended at the end.