CHAPTER III
RESEARCH DESIGN AND METHODS USED IN THE STUDY

As mentioned in the preceding chapters, ICT plays a major role in the development of libraries today. Modern libraries are able to provide improved information services due to the growing Internet, e-resources and computer software. Although the number of automated libraries is growing every day, yet there are numerous libraries in a developing country such as India which are still traditional. The gap between the traditional libraries and modern ICT based libraries is widening. The preceding chapters have pointed out that the open source software and open access research is of high importance for the library communities. Thus, the present study attempts to address this digital divide by Open Source Software and Open Access resources available on the Web. The libraries with no or minimal financial resources can provide better services to their users through Open Source Software and Open Access resources.

This chapter deals with the design of the research and methodology used in the study. The universe of the study, the operational definitions, the techniques used for data collection, the period covered under the study and steps towards data analysis are also discussed in this chapter.

3.1. The universe of this study

The universe for the present study is open source software and open access literature. The open source software which could be beneficial for a library is covered under this study. The whole sphere of open source movement is also the subject of this study. In addition to open
source software, open access movement is also under the universe of this study. However, free but commercial software and Web 2.0 tools do not come under the purview of this study.

3.2. The Methodology used in the study

This study is an exploratory and descriptive research on open source software and open access resources that are useful to modernize a library and thus also analyses the open source movement and open access movement. To conduct this study, the researcher did a comprehensive literature review of the previous studies in these areas. The present research design builds on research done on open source software and open access literature from the purview of libraries using a descriptive research method.

For this research study a qualitative research design was formed to enrich the understanding of the open source software movement and open access movement in addition to useful software available for a library.

3.3. Sources of Information

Books have been considered great source of information for any study since a long time and it is also not an exemption for this study. A number of books written on open access and open source software were referred by the researcher to get in touch with the subject. However, with the inception of information technology, Internet, and World Wide Web, we get another form of information, i.e., digital or electronic form. This form of information is not only easy to disseminate but also to share in real time. Now an author is not required to collect vast amount of information to publish it. S/he can instantly publish any small piece of information through his or her blog/website. This instant publishing has increased the speed of research
by sharing latest research results. Hence the researcher has also used various resources from
the Web to collect information required by him.

**Google Scholar:** Google Scholar is a free search engine that indexes full text of scholarly
literature published by various publishers in different disciplines. It was started in 2004.
Google Scholar indexes peer reviewed and scholarly online literature published through
online journals both open access and commercial, online books and online repositories of
institutions throughout the world. This search engine proved very important due to its nature
of open access to search the related literature for this study. A gist of the various online
sources used for this study is as following.

**Science Direct:** Science Direct is a database of full text scholarly journals from several fields
including library and information science. This database was useful to understand current
trends in open access and open source software.

**IEEExplore:** IEEExplore is a database of scholarly journals from the field of technology and
engineering. It covers several journals dealing with library automation and open source
software. This database was useful to touch the various aspects of open source software
movement and library automation.

**Emerald database:** Emerald database is a very prominent database of scholarly journals
especially from the field of library and information science. The researcher accessed wide
number of articles talking about open source software, open access, library automation, etc.
from various journals covered under this database. Some prominent journals of this database
are Journal of Documentation, Library Hi Tech, Library Management, Library Review, The
Electronic Library, Online Information Review, Program: electronic library and information systems etc.

**Springer Link:** Springer link is also a database of scholarly journals and books. It offers access to some but important journals in library and information science. The journals proved important for the purpose of this study was International Journal on Digital Libraries.

**Other Sources:** Literature not covered under the above databases was browsed using various search engines such as Google, Bing, Mamma, Yahoo, etc. These search engines helped the researcher to find information from newspapers and articles and reports not indexed in any of the above database.

### 3.4. Operational definitions

The term ‘open source software’ in this study refers to the software which are available free of cost, available with source code and do not have any license restriction with respect to their use, modification and redistribution. The user of open source software can exercise all rights of the owner of the software and actually there is no owner of the software but the software is developed by a community of software experts.

This study has also used the term ‘free software’. In this case free does not mean free from price but it is freedom to use, study, and distribute the software. It is freedom to help the others. Both ‘open source software’ and ‘free software’ are not any different in their principles but they are different ethically.

Similarly the term ‘open access’ in this study refers to the authentic scholarly writings which are available through Internet to the users without paying any subscription fees and without
any copyright restriction with respect to their use, reproduction, and redistribution. However, the authors of open access scholarly writings have the right to be cited by the researchers who use these writings in carrying out their research.

3.5. Data collection: methods and techniques used

Being a descriptive research, the data for this study was collected from scholarly literature on open access and open source software. To proceed with the research, researcher studied the vast literature related to the subject. Researcher collected data primarily from books, articles, etc. written since the inception of the concepts till present. To collect the data, researcher has used various sources such as books and journals available in the libraries. Open access literature available through Internet and various proprietary databases were also extensively used.

To retrieve the literature available on Internet in the public domain, researcher used various search engines such as Google Scholar, Google, Bing, Mamma, Yahoo, Search.com, Ask.com, dogpile, etc. In addition to the general Search Engines, the researchers had also used the specific databases that are known to have scholarly writings on the related field. Such databases include Science Direct, Springer Link Service, Emerald database, ieeexplorer, etc. These databases cover major proprietary scholarly journals of library and information science.

All these resources helped the researcher to access comprehensive literature on the subject and on the basis of this literature, the researcher could trace the open source software and open access movement.
3.6. Period of data collection

The duration of data collection was 3 years, i.e., 2010 to 2013. During this period literature from related subject was gathered from every source discussed above. No literature after mid 2013 was retrieved. This point is being stressed here as the world of open source software as well as open access resources keeps growing continuously.

3.7. The steps towards Data analysis

The first step towards data analysis was to unravel the open source software movement and its penetration into the field of library and information science in late 1990s. This is achieved through analysing the previous studies in this area. Chapter IV analyses this story that revolutionised the information services in libraries.

The next step was to analyse the technical features of the prominent open source software for libraries. Researcher has selected software from various categories such as library management software, digital library software, etc. which are used in high percentage among automated libraries. Chapter V reports this analysis and also presents an analysis of the main features of software based on the existing studies.

Further, the attempt was to identify and explain an optimum open source software model for a library. This model is suggested keeping in mind the libraries of India that are having inadequate finances and technical expertise. The researcher has also given the reasons and justifications for suggesting this particular model. This fulfils the third objective of this study.

To fulfil the fourth objective of the study, Chapter VII deals with the concept of open access in detail from a librarian’s point of view. It enunciates the analytical chronology of the open access movement under various headings. This is achieved through analysing the previous
studies in this area. As open access is very helpful to the libraries to provide excellent information services to the users the researcher has consulted various open access journals directories such as DOAJ, and other sources where open access journals are listed and compiled a list of more than 5000 open access journals from various fields in English language. This exploration fulfilled the fifth objective of this study. A list of titles of these journals is presented at appendix A.

During the accumulation of the links of open access journal researcher found that an open access journal is available almost for every subject. However, broadly these journals could be categorised under following subjects:

**Medical Science:** Medical science is dominating open access world by having almost 18% open access journals in the subject. Medical science is a subject which is directly related to every single human being on the earth. Having maximum open access journals in medical science eased the research in medical and health sciences.

**Education:** Open access journals are also flooded in education. After medical science, education has the large number of open access journals published in several languages.

**Life Science:** life science is another area where a number of open access journals are available. In life science, user may find journals dealing with biology, zoology, biochemistry, and biotechnology etc.

**Chemistry:** Chemistry also established as an attractive subject among open access publishers. More than 100 English language open access journals are available in various aspect of chemistry.
**Literature and Linguistics:** One may find a wide range of open access journals in literature and linguistics. Researchers working in this area may not get affected due to unavailability of subscription based scholarly journals in their libraries as this area is covered hugely by open access publishers.

**Others:** As discussed earlier, open access journals are available on almost every subject. Subjects not discussed above also have good number of open access journals available online. Computer science, Engineering, Philosophy, History, Economics, Management, Generalia, Agriculture, Library and Information Science are the subjects that have more than 100 open access journals each in English language. Other subjects of social sciences, humanities, science, technology, arts, etc. have 10 to 100 open access journals in English language. However there is a need of open access journals in areas of naval science, nuclear physics, acoustics, environmental engineering, and hydraulic engineering.

Thus, the above research design and methodology helped the researcher to achieve all the objectives of the present study in an efficient way.