6.1. Introduction

The present study was to assess the status of engineering college libraries in Kerala in terms of availability of resources, their financial positions, automation and application of information technology, provision of electronic resources etc. The study also aimed to develop a library consortium for engineering colleges in Kerala.

This chapter contains summary of findings of the analysis, tenability of hypotheses, suggestions for the improvement of the present status of engineering college libraries in Kerala and suggestions for further research.

6.2. Summary of Findings

The data collected through various means were analyzed in the previous chapter. The analysis of data has revealed a number of useful findings and they are summarized below:

6.2.1. General Information
1. All categories of engineering colleges like Government, Aided and Self financing Colleges provide research facility. It is revealed that 21.42 per cent engineering colleges in Kerala are research level institutions.

2. Majority of the libraries of engineering colleges in Kerala have membership in between 1500 and 2000. Only one college (College of Engineering, Trivandrum) has library membership more than 2000.
3. Users of the Government Engineering College libraries are making use of their libraries more when compared to Aided Colleges and Self financing Colleges. An average of 198 users daily visits the libraries of engineering colleges in Kerala and majority of the users have been using their libraries for 2 to 4 years.

6.2.2. Library Collections

4. Most of the libraries have different types of collections like books, journals, bound volumes of journals, standards, dissertations, project reports etc. A few (35 per cent) of them have subscription to online journals and online databases.

5. Majority of the engineering college libraries in Kerala have a collection of below 25000 volumes of books. Few libraries (14.28 per cent) have below 10,000 volumes of books and other few libraries (14.28 per cent) have book collections more than 50000. These libraries are attached to Government and Aided Engineering Colleges.

6. Most of the libraries of Government and Self financing Colleges do not have considerable subscription to foreign journals and most of them have below 10 numbers of foreign journals. Majority of the Aided Engineering College libraries have more than 50 numbers of subscriptions. Only one Aided College library has more than 100 subscriptions to foreign journals.

7. A good number of libraries (35.71 per cent) have below 25 numbers of Indian journals. Few libraries (7.14 per cent) have below 10 numbers of subscription and other few libraries (14.28 per cent) do not have subscription to Indian journals at all. Only one library (7.14 per cent) has more than 100 Indian journals and this library is attached to Self financing Engineering College. Large majority of the Government College libraries have below 25 numbers of Indian journals.
8. Only few libraries are receiving gratis journals and out of this a good number of libraries (42.85 per cent) are getting below 10 numbers of gratis journals and most of these libraries are attached to Government Engineering Colleges.

9. More than one fourth libraries (28.57 percent) of engineering college libraries in Kerala do not have collections of back volumes of journals and 42.85 per cent libraries have below 1000 numbers of back volumes of journals. Few libraries (21.42 per cent) have back volumes in between 1001-5000 and only one library (7.14 per cent) has more than 5000 numbers of back volumes of journals.

10. Only one college library (College of Engineering, Trivandrum) has a theses collection and this library has 500 numbers of theses/dissertation.

11. Most of the libraries (64.28 per cent) of engineering colleges in Kerala do not have standards collection at all. Few libraries (14.28 per cent) have below 100 and in between 101-500 numbers of standards. Only very few libraries (7.14 per cent) have more than 500 volumes of standards.

12. Most of the libraries (64.28 per cent) have no collection of technical reports. Few libraries (14.28 per cent) each have a collection below 1000 and in between 1001-2000 respectively. Only very few libraries (7.14 per cent) have more than 2000 numbers of technical reports and these libraries are attached to Self financing Colleges.

13. Majority of the libraries (71 per cent) have CD/DVD collections. About 35 per cent libraries have CD/DVD collection in between 101-300 and among these most of the libraries are attached to Government Engineering Colleges and Self financing Engineering Colleges. A good number of libraries (28.57 per cent) do not have CD/DVD collection at all.
14. Only few libraries (14.28 per cent) have collection of maps and video cassettes. Out of this one Government College library (College of Engineering, Trivandrum) has a collection of 100 maps and only one Aided College library (TKM College of Engineering, Kollam) has a collection of 5 academic video cassettes. All the other libraries do not have collection of video cassettes or maps.

15. Few libraries (35.71 per cent) of engineering colleges in Kerala have subscription to e-journals and CD-ROM databases and few libraries (21.42 per cent) have online databases and multimedia products. Only one library (7.14 per cent) has e-books subscription. Most of these libraries are attached to Aided and Self financing Engineering Colleges.

16. Most of the libraries of engineering colleges in Kerala have no local electronic resources. A few libraries (14.28 per cent) have project reports and conference proceedings. Few libraries (7.14 per cent) have pre-prints of journal articles and course materials in electronic format. All these libraries are attached to Self financing Colleges.

17. Majority of users (63.36 per cent) of the engineering college libraries in Kerala are satisfied with the collection of books and journals. However, a very few users declined to express their opinion.

18. A considerable number of (about 50 per cent) librarians considered their information resources inadequate to meet the requirements of users. Most of them thought lack of sufficient budget as the reason for the inadequacy of their resources. Few librarians (35.71 per cent) considered lack of modern
infrastructure as the reason and other few librarians (35.71 per cent) viewed lack of library personnel as the barrier in providing adequate resources.

19. Large majority of librarians (78.57 per cent) of engineering colleges in Kerala opined that their resources were properly utilized by the user community. A few librarians thought otherwise and they cited the reasons for non-utilization as lack of awareness of users about the sources, lack of skills of the users to use the sources, lack of skills of library staff in helping the users and absence of proper arrangement.

6.2.3. Library Budget

20. Majority (85.71 per cent) of engineering college libraries in Kerala have below 10 lakhs of average annual budget. Only Aided Engineering College libraries have substantial budget allocation when compared to other categories of colleges. During the financial years 2003-04 to 2004-05 Aided College and Self financing College libraries received gradual increase in their budget allocation while Government College libraries shown a sudden hike during 2004-05. It was due to the fact that College of engineering, Trivandrum, has received a special grant from the government for modernization of the library. Results of ANOVA test showed that there is no significant difference in the budget allocation between each type of institution, between the years, and between type of institution and the years.

21. There is no considerable allocation for electronic resources in the budget of engineering college libraries especially in Government Colleges and Self financing Colleges. Only Aided Engineering Colleges have got some allocation for electronic resources and this allocation ranged from 10 per cent to 50 per cent of total library budget.
22. A good number of engineering college libraries in Kerala do not have enough budget to meet their requirements. The budget allocations of Government Colleges are very poor and they are struggling to provide adequate library resource and services. In order to provide electronic information sources and services more financial assistance is required. Due to limited budgets they are not able to subscribe to sufficient number of foreign journals and electronic databases. But, in the case of libraries of Aided and Self financing Engineering Colleges in Kerala, the position is somewhat better when compared to Government Colleges. They get financial assistance from their parent body in response to their needs. In these libraries also, budget allocation for electronic resources is not commendable. About 70 per cent librarians felt that their budget allocation is not adequate to meet their needs especially for electronic information resources.

6.2.4. Technical Organization of Library Collection

23. Most of the libraries (92.85 per cent) of engineering colleges in Kerala have fully classified their collection and a very few libraries (7.14 per cent) have only partially completed the classification work. About 93 per cent libraries are using Dewey Decimal Classification (DDC-20th ed) and one Aided College library (MA College of Engineering, Kothamangalam) is using Colon Classification (CC-6th ed).

24. Majority (57.14 per cent) of the libraries of engineering colleges in Kerala have fully catalogued their collection. A few libraries (35.71 per cent) have completed the work only partially. Anglo American Cataloguing Rules (AACR) is found to be the widely used (71.42 per cent) catalogue code and only few
libraries (14.28 per cent) are using Classified Catalogue Code (CCC) for cataloguing purpose. About 7.14 per cent libraries have not yet catalogued their collection and these libraries are attached to Government Engineering Colleges.

25. A good number (57.14 per cent) of engineering college libraries in Kerala are using card form of catalogue. About 14.28 per cent libraries are using OPAC and 7.14 per cent libraries are providing both card form and OPAC simultaneously.

6.2.5. Library Personnel
26. Majority of the libraries (92.85 per cent) of engineering colleges in Kerala have less than 5 library professionals and only one library (7.14 per cent) has more than 5 library professionals and this library is attached to Government Engineering College.

27. Majority (72.22 per cent) of the library professionals of Government Engineering Colleges and Self financing Colleges (83.33 per cent) and half of the library professionals of Aided Engineering Colleges are graduates in Library and Information Science. Only few library professionals (22.22 per cent) of Government Colleges, Aided Colleges (25 per cent) and Self financing Colleges (16.66 per cent) are postgraduates. It is revealed that two professionals have only certificate course in Library Science.

28. Large majority (75 per cent) of the library professionals in all categories of Engineering Colleges are graduates in Library and Information Science and only few (20 per cent) library professionals are postgraduates. Only a few (30 per cent) library professionals in all categories of Engineering Colleges in Kerala have additional post graduation in general subjects. All the library professionals of Government Engineering Colleges, half of the professionals of Aided
Engineering Colleges and 66 per cent of the professionals of Self financing Engineering Colleges have computer knowledge.

29. Libraries of all categories of engineering colleges have below 5 numbers of library non professionals in their libraries. About half of the non professionals have not given their qualifications and it may be due to that their qualification may be below SSLC. Among the other half, majority have only SSLC and few of them have PDC. All the non professionals in the libraries of Government Engineering Colleges are not computer literate. Among the non professionals of Aided Engineering Colleges, very few (18 per cent) persons are computer literate. All the non professionals of Self financing Engineering Colleges do not have computer knowledge. Out of the total non professionals, large majority (96 per cent) do not have computer knowledge at all.

30. Majority of the users (94.38 per cent) opined that library staff is helpful in general and they have sufficient knowledge to answer their queries. A good number of users (58.02 per cent) also felt that they are getting personalized attention from their library staff. Majority of the users of the libraries of different types of engineering colleges in Kerala rated the performance of library staff satisfactory and above.

6.2.6. Library Services

31. Most of the libraries of engineering colleges in Kerala are providing various traditional as well as modern services like circulation of new arrivals, inter library loan, reprographic services, reference services, compilation of bibliography, current awareness service, user education, internet and related services and issuing of back volumes of journals. No library is providing Selective dissemination of information and Content page service.
32. In Government Engineering College and Aided Engineering College libraries, only half of the users are aware of the services like content page service, circulation of list of new arrivals, inter library loan, user education and selective dissemination of information. In Self financing Engineering College libraries all the above services except selective dissemination of information and user education are familiar to more than half of the users. In Aided Engineering College libraries, more users (about 56 per cent) are familiar with reprographic service and reference service. Content page service, inter library loan, current awareness service and user education service are familiar to more than 30 per cent users. Selective dissemination of information is familiar to less number (19 per cent) of users.

33. Majority of the users (61.49 per cent) felt that they had been receiving sufficient number of books and journals from their libraries and they are happy with the current loan period.

34. About half of the libraries are using card system as their circulation method and large majority of the libraries provide open access facility in their stack area.

35. Large majority of the users (80.22 per cent) opined that they are not getting inter library loan service from their libraries.

36. A good number of users (73.84 per cent) of engineering college libraries in Kerala are satisfied with the services they get in general from their libraries. However, a good number of users (36.16 per cent) demanded more services from their libraries. The common services demanded by the users are online databases, faster internet connectivity, text book section in the library, more electronic journals and electronic books, extension of loan period, enhancement of library timing etc.
37. Majority of the users of Government Engineering Colleges feel that the number of books and journals are sufficient to meet their requirements. They also feel that the current loan period is satisfactory. They did not agree that libraries of Government Engineering Colleges in Kerala are providing satisfactory internet services in their libraries and felt that speed of internet connection and provision of inter library loan facilities are far below the expected level.

38. Large majority of the users of Aided Engineering College libraries in Kerala agreed that their libraries have sufficient number of books and journals. They did not agree that their libraries are providing satisfactory internet facilities and current loan period of the library is satisfactory. They felt that speed of internet connection and provision of inter library loan facilities are far below the expected level.

39. In the Self financing Engineering Colleges, majority of the users are satisfied with the number of books and journals, current loan period and services of the library. They are not satisfied with the provision of inter library loan, internet and speed of internet.

40. Majority of the users of all categories of engineering college libraries in Kerala are not satisfied with the provision of inter library loan, internet and speed of internet.

41. Most of the librarians of engineering colleges in Kerala thought that lack of modern information technology infrastructure and insufficient budgetary provisions are the main bottle necks in the provision of satisfactory internet
connectivity. Due to this sorry state of affairs, internet based information sources and services of library are not properly made available to the users.

6.2.7. Electronic Resources

42. Majority of the users (64.4 per cent) of engineering college libraries in Kerala observed that internet facility is not accessible in their libraries.

43. Library users make use of internet facility for web browsing, email searching, chatting, accessing online databases, accessing e-journals, job search, literature survey, Seminar preparation, downloading of software etc. Most of the users are using internet for web browsing, email searching and for accessing e-journals.

44. It is found that BSNL has the highest share (about 57.14 per cent) among the internet service providers in various engineering colleges in Kerala. Only 7.14 per cent colleges have VSNL connectivity.

45. About half of the engineering colleges have 64 kbps of bandwidth and only few colleges (22 per cent) have bandwidth of 128 kbps and 2mbps. Leased line connection has more share (35.71 per cent) followed by V-SAT, ISDN, cable network and dial-up connection.

46. Majority of the users (around 76 per cent) from all categories of engineering college libraries in Kerala are not satisfied with the speed of internet connectivity available in their libraries.

47. A good number of users (56 per cent) rated internet based information resources of their libraries below satisfactory and rating of the internet based information resources in the library are dependent of type of institution.
48. In the case of the Government and Aided Colleges, about 49 per cent users opined that internet based information services are satisfactory and above. But in the case of Self financing Colleges, only 32.6 per cent users have this opinion. It is seen that majority of the users rated the internet based information services of their libraries below satisfactory.

49. Majority (69 per cent) of the users of engineering colleges in Kerala prefer electronic resources to print resources. Most of the librarians of engineering colleges also favoured electronic resources because of their quick accessibility, easy dissemination, storage facility etc.

50. It is seen that among all categories of libraries, users were mainly aware of IEL online (61 per cent), Applied science & Technology Plus (40 per cent), ASME online journals (34 per cent), ASCE online journals (33 per cent), ACM Digital Library (32 per cent), Ei Compendex Plus (26 per cent), J-Gate (35 per cent), Science Direct (42 per cent) and Indian Standards online (22 per cent). Other resources like Compendex and MathsciNet seem to be unpopular and hence only few users (20 per cent or below) are aware of these resources.

51. Great demand from users was received for IEL Online (59 per cent) followed by Science Direct (46 per cent), Applied Science & Technology Plus (41 per cent), J-Gate (38 per cent), ASME Online (37 per cent), Indian Standards Online (36 per cent), ASCE Online (35 per cent), ACM Digital Library (34 per cent), Ei Compendex (29 per cent) and MathSciNet (17 per cent).

52. Most of the librarians (78 per cent and above) of engineering colleges are aware of electronic information resources like IEL online, ACM Digital Library, Ei Compendex Plus, J-gate, Indian Standards, ScienceDirect, ASME, ASCE and

6.2.8. Library Automation and Networking

53. In Government Engineering College libraries, half of the libraries have server class machines, Pentium IV systems, hubs and UPS. In Aided Engineering Colleges, majority of the libraries possess Pentium III and Pentium IV machines, CD server and UPS facility. In Self financing Engineering Colleges, about half of the libraries have Pentium IV machines and few libraries have modem and hubs, barcode printer, scanner and UPS facility.

54. Few Self financing College libraries (21.42 per cent) do not have photocopying machines and very few libraries have laser printer and book binding unit. About half of the libraries have scanners and water cooler facility. No library has LCD Projector and Web camera.

55. Majority of the libraries (71.42 per cent) of engineering colleges in Kerala are automated. Most of the libraries (42.85 per cent) are using locally made software and only few libraries (14.28 per cent) use SOUL and LIBSOFT and due to this there was no uniformity or standardization in the automation of engineering college libraries in Kerala.

56. Majority of the libraries of engineering colleges in Kerala are using Windows 2000/2003/XP as their network operating system. Few libraries are using Windows NT and Windows 98 and about half (50 per cent) of the libraries do not have independent library networks.
57. No library of engineering colleges in Kerala is making use of any of the digital library software in their libraries for providing digital information sources and services.

58. A good number of libraries (57.14 per cent) of engineering colleges in Kerala are providing OPAC facility to users. Majority of the libraries (57.14 per cent) with OPAC facility are providing popular access points like author, title, subject and publisher. Few libraries (28.57 per cent) are providing other access points like class number, words in search, Boolean search, truncation, series, etc. also.

59. A considerable number of libraries (42.85 per cent) are making use of barcode facility for circulation purpose in the libraries of engineering colleges in Kerala. Many libraries (28.57 per cent) are also making use of barcode facility in conducting stock verification in the libraries of engineering colleges in Kerala.

60. Only few colleges (28.57 per cent) have campus intranet facility. Out of these only few colleges have connection to all departments/centers. One Government College has connection restricted to computer center only. Only one engineering college (College of Engineering, Trivandrum) has system administrator to look after the intranet.

61. About half of the libraries of Government Engineering Colleges and 66.6 per cent of the libraries of Aided Engineering Colleges have independent library networks. About 42.8 per cent libraries of Self financing Engineering Colleges have independent library networks.

62. Majority of (78.57 per cent) the engineering colleges in Kerala have college website and that contains library details also. Only one library (7.14 per cent) has separate library website and this library is attached to a Self financing College.
6.2.9. Library Networks and Consortia

63. Only few libraries (25 per cent) of Government Engineering Colleges and Aided Engineering Colleges (33.33 per cent) and 42.85 per cent of Self financing College libraries are participating in national library networks and all these libraries are participating in DELNET. No library under study is participating in any of the regional library networks for the purpose of resource sharing and cooperation.

64. Large majority (91.74 percent) of the users of engineering college libraries in Kerala are not aware of library consortia activities of the country and majority of librarians (85.71 per cent) are familiar with the consortia activities of the country. It is found that only few libraries (14.28 per cent) are participating in a consortium and these libraries are participating in INDEST consortium. Libraries of Self financing Engineering Colleges do not participate in any of the consortia activities.

65. An overwhelming majority (94.1 per cent) of users supported the idea of forming a library consortium exclusively for the engineering colleges in Kerala. Large majority (85.71 per cent) of librarians also whole heartedly supported the formation of a consortium for engineering college libraries in Kerala.

66. It is found that major barriers in the formation of a consortium for engineering college libraries in Kerala include government approval for Government Engineering Colleges, existing rules and regulations, equal sharing of financial commitments, lack of infrastructural facilities, lack of trained professional staff, hesitation of management toward electronic resources,
unnecessary audit objection towards the subscription of electronic resources, awareness and preference of users about e-resources, support from the part of parent body, attitude of librarians and users, etc. It is also found that heterogeneous nature of parent body of engineering colleges can be a hurdle in the formation of the consortium.

6.3. Tenability of Hypotheses

On the basis of the findings drawn out of the study, the tenability of the hypotheses formulated for the study is tested.

6.3.1. Hypothesis 1

“The information resources and services of Engineering College Libraries of Kerala are below the expected level”

It is evident from the findings 4 to 16 that most of the libraries have below 25000 volumes of books and most of them have very meager subscription to journals. About one fourth libraries do not have collection of back volumes of journals at all. Only one library has collection of dissertations and most of the libraries do not possess standards and technical reports. CD/DVD collections of most of the libraries are below 100 and very few libraries have collections of maps, video cassettes and subscription to electronic journals and CD-ROM databases. Also, most of the engineering college libraries in Kerala do not have local electronic resources.

A good number of users considered the collection of books and journals satisfactory. However, as per the finding 18 about half of the librarians felt that their information resources are inadequate. Nevertheless, the finding 19
revealed that majority of the librarians opined that information resources of the libraries are properly utilized.

It is established through the findings from 31 to 35 that most of the libraries provide mainly traditional services like book lending, reprographic service, reference service, circulation of back volumes of journals, circulation of list of new arrivals etc. Modern services like current awareness service, selective dissemination of information, content page service, internet based information services etc. are provided by very few libraries. Only few libraries are offering user education. More number of users are satisfied with the number of books and journals issued to them, but not satisfied with the provision of inter library loan, internet and speed of internet. This is established by the findings from 37 to 40. Most of the librarians thought that internet based information sources and services are not properly made available to the users. This is evident from the finding 41.

**Hence the first hypothesis has been established by the findings of the study.**

6.3.2. Hypothesis 2

“The technical organization of the collection of the libraries of Engineering Colleges in Kerala is not satisfactory”

Most of the libraries of engineering colleges in Kerala have fully classified and catalogued their collection. Most of the libraries are using standard tools like Dewey Decimal Classification Scheme (DDC) and Classified Catalogue Code (CCC) for the purpose of classification and cataloguing. Most of the libraries are using card catalogue and few libraries have OPAC as the physical form of library catalogue, as per the findings 23, 24 and 25. Majority of the libraries with OPAC facility provide popular access points like author, title, subject and publisher and
few libraries are providing other access points like class number, words in search, Boolean search, truncation, series, etc. also. This is established by the finding 58.

Thus the second hypothesis has been rejected by the findings of the study.

6.3.3. Hypothesis 3

“The libraries of Engineering Colleges in Kerala are under-staffed and facing the problem of lack of professional expertise”

Majority of the libraries of engineering colleges in Kerala have less than 5 library professionals and majority of them possess bachelor degree in Library and Information Science. Only few library professionals are postgraduates. It is revealed that two professionals have only certificate course in Library Science. Only a few library professionals in all categories of engineering colleges in Kerala have additional post graduation in other subjects. However, majority of the professionals have computer knowledge. This is proved by the findings from 26 to 28. Libraries of all categories of engineering colleges have below 5 numbers of library non professionals in their libraries. Majority of them have only SSLC and few of them have PDC. Large majority of them do not have computer knowledge at all. This is established by the finding 29.

Majority of the users opined that library staff is helpful in general and have sufficient knowledge to answer their queries and rated their service satisfactory. This is proved by the finding 30. Some librarians viewed that lack of library personnel as the barrier in providing adequate resources and lack of skills of library staff is the reason for the non utilization of library resources. This is proved by the findings 18 and 19. The finding 66 proved that lack of trained professional staff is considered as one of the major barriers in the formation of a consortium for engineering college libraries in Kerala.
Hence the third hypothesis has been proved by the findings.

6.3.4. Hypothesis 4

“The fiscal condition of the libraries of Engineering Colleges in Kerala is inadequate to meet the requirements of users”

It is proved from the findings 20 to 22 that majority of the libraries have below 10 lakhs of average annual budget. The libraries of Aided Colleges and Self financing Colleges have got gradual increase in their budget allocation, but, the condition of Government College libraries is poor. There is no considerable allocation for electronic resources in the budgets of most of the libraries. Only Aided College libraries are in a better position as far as budget allocation for electronic resources are concerned. Due to scarcity of budget, most of the libraries are struggling to subscribe sufficient number of foreign journals and electronic databases.

Most of the librarians of engineering colleges in Kerala thought that lack of sufficient budgetary provisions is the main bottle neck in the provision of satisfactory internet connectivity. Due to this sorry state of affairs, internet based information sources and services of library are not properly made available to the users. This is proved by the finding 41. A good number of librarians opined that inadequate budget is the main reason for the inadequacy of the information resources and they considered their resources inadequate to meet the requirements of the users. This is established by the finding 18.

Hence this hypothesis has been confirmed by the findings of the study.
6.3.5. Hypothesis 5

“Users are not satisfied with the present library and information services and they are demanding for new services”

The findings 31 to 35 summarized the various services offered by the libraries of engineering colleges in Kerala. Most of the libraries are emphasizing on traditional services and only a few libraries have started providing modern information services. Findings 37 to 41 proved that most of the users are not satisfied with the present range of services especially in the provision of inter library loan and internet services. Internet based information services are not properly made available to the users. Majority of the users rated that internet based information resources and services of their libraries are below satisfactory. This is established by the findings 47 and 48.

As per finding number 36, a good number of users demand for more services from their libraries. The services demanded by the users include online databases, faster internet connectivity, more electronic journals and electronic books, separate text book section, extension of loan period, enhancement of library working hours etc.

Hence this hypothesis has been substantiated by the findings.

6.3.6. Hypothesis 6

“The current status of automation and application of Information Technology in the libraries of Engineering Colleges in Kerala are not satisfactory”

Many of the engineering college libraries in Kerala have basic hardware facilities like computers, printers, scanners, Servers, CD/DVD players etc. Many libraries have photocopying machines. Majority of the libraries are automated,
however, most of them are using locally made software and due to this there was no uniformity or standardization in the automation of engineering college libraries in Kerala. This is established by the findings 53 to 55. 

Engineering college libraries are using different operating systems like Windows NT, Windows 98, Windows 2000/2003/XP etc., but, about half of the libraries do not have independent library networks. This is proved by the finding 56. Many of the libraries are providing OPAC facility with popular access points like author, title, subject, publisher, class number etc. This is revealed by the finding 58. Many libraries are making use of barcode facility for circulation purpose and for conducting stock verification also. This is shown by the finding 59.

The findings 13, 15 and 16 revealed that few libraries have collection of CD/DVD ROMs. Only a few libraries have subscription to e-journals, CD-ROM databases, online databases, multimedia products etc. Most of the libraries do not have local electronic resources like pre-prints of articles, project reports, conference proceedings etc.

As per finding number 38 most of the librarians viewed that lack of modern information technology infrastructure is one of the main reasons for not providing speedy internet connectivity and adequate internet based information sources and services. The findings from 45 to 48 summarized that about half of the engineering colleges have 64 kbps bandwidth of internet connectivity and very few colleges have high bandwidth of 128 kbps or 2mbps. More colleges have leased line connection of BSNL and others have connections like dial-up, ISDN, V-SAT etc. Many of the users rated internet based information resources and services below satisfactory.
Libraries of engineering colleges in Kerala do not have digital collection for providing digital information sources and services. This is established by the finding 57. Only a few libraries have campus intranet facility connecting all departments/centers. Though many colleges have websites with library details, only one college has separate library website. Only one college has system administrator to look after the intranet and other applications of information technology. This is proved by the findings from 60 to 62. Most of the librarians thought that application of information technology is not adequate to meet the requirements of the users. This is revealed by the finding 41.

**Hence this hypothesis has been validated by the findings.**

6.3.7. Hypothesis 7

“The libraries of Engineering Colleges in Kerala do not provide electronic information resources and services adequately”

The findings from 13 to 16 established that many of the engineering college libraries in Kerala do not have electronic resources like online databases, electronic books and journals, CD-ROM based databases etc. As per finding number 49, majority of the users preferred electronic resources to print resources. Though many of the electronic resources in engineering and technology like IEL online, Applied Science & Technology Plus, ASME, ASCE, ACM Digital Library, Science Direct, J-Gate, Ei Compendex etc. are familiar to many users and librarians, none of these resources are subscribed by the libraries at present. Majority of the users and librarians demanded the subscription of these electronic resources in order to meet the requirements of the users. This is proved by the findings 50 through 52. As per findings 22 and 41, majority of the libraries do not provide adequate electronic information sources and services...
due to inadequate budget allocation and lack of modern information technology infrastructure.

Hence this hypothesis has been confirmed by the findings of the study.

6.3.8. Hypothesis 8

“The libraries of Engineering Colleges in Kerala do not participate in any of the library consortia initiatives”

Only a few libraries are participating in a consortium and these libraries are participating in INDEST consortium. Majority of the users are not aware of the consortia activities of the libraries, but, majority of the librarians are familiar with consortia activities of the libraries. This is revealed by the finding 64. Major barriers in the formation and participation of a library consortium include lack of infrastructural facilities, lack of sufficient budget, lack of trained professionals, awareness and preference of users about e-resources, attitude of librarians and users etc. This is established by the finding 66.

Few libraries of all categories of engineering colleges in Kerala are participating in national library networks and all these libraries are participating in DELNET. No library under study is participating in any of the regional library networks for the purpose of resource sharing and cooperation. This is proved by the finding 63.

Hence this hypothesis has been partially substantiated by the findings.

6.3.9. Hypothesis 9

“The Academic community and the librarians of Engineering Colleges in Kerala are in favour of the formation of a library consortium for Engineering Colleges in Kerala for resource sharing and collaboration”
An overwhelming majority of librarians wholeheartedly supported the formation of a consortium for engineering college libraries in Kerala for resource sharing and collaboration among the libraries of engineering colleges. Majority of the users also supported the idea of forming a library consortium exclusively for the engineering colleges in Kerala. This is proved by the finding 65.

The major barriers identified in the formation of a consortium for engineering college libraries in Kerala include government approval for Government Engineering Colleges, existing rules and regulations, equal sharing of financial commitments, lack of infrastructural facilities, lack of trained professional staff, hesitation of management toward electronic resources, unnecessary audit objection towards the subscription of electronic resources, awareness and preference of users about e-resources, support from the part of parent body, attitude of librarians and users, etc. It is also found that heterogeneous nature of parent body of engineering colleges can be a hurdle in the formation of the consortium. This is established by the finding 66. 

**Hence this hypothesis has been proved by the findings.**

### 6.4. Suggestions for the Improvement of the Present Status of Engineering College Libraries

On the basis of the findings revealed by the study and on the basis of the large number of suggestion/comments received from the users and librarians of the Engineering colleges, a set of suggestions are put forwarded here for the improvement of the present status of engineering college libraries in Kerala.

1. Libraries of engineering colleges should build a balanced collection giving due importance to various categories of information sources. Collection of
books has to be improved. More number of foreign as well as Indian journals may be subscribed. In order to save money, subscription of electronic journals under consortia agreement can be thought of. Considering the technological advances, more importance can be given for the collection of digital information resources like online databases, CD-ROM based databases and other web based information resources. Emphasis may be given for the development of local digital resources like pre-prints of articles, project reports of students and conference proceedings.

2. A text book reference section, a collection of all the text books prescribed in the syllabi of the courses conducted by the parent institution may be established.

3. Adequate funds have to be made available to the libraries for developing a balanced collection of documents in print as well as digital format. Libraries of government colleges may be provided with more budget allocations for subscription to Indian as well as foreign journals. Adequate funds should also be made available to the libraries for procuring necessary hardware and software from time to time and sufficient budgetary provisions on regular basis should be made to maintain the computerized system intact.

4. All libraries should complete technical processing of their collection by using uniform international standards. All libraries may provide OPAC facility with as many access points as possible. Usage of uniform standard software would facilitate compilation of union catalogues and other similar databases. Web OPAC facility may be provided so that users can access the library catalogue even if they are away from the campus.
5. Sufficient number of professionals and non professionals may be provided in the libraries. Steps may be taken to improve the information technology skills of the staff. Staff should be given proper training for the maintenance of library software and databases. They may be given opportunity to participate continuing education programs, refresher courses, workshops, seminars etc. in order to get more exposure in the field of library and information services. Library staff should be well familiar with the information sources and services of their libraries so that they can answer the queries of users regarding the services of libraries.

6. All the libraries of engineering colleges should provide computerized Information literacy Programs, Current Awareness Service, Selective Dissemination of Information, Reference Service, Content Page Service, Multi Media Service and web based services. User education programs should be conducted regularly. Special user conventions or workshops may be conducted to introduce the electronic resources of the libraries. Demonstrations of commercial databases can be arranged if the library subscribes to it.

7. Electronic resources pertaining to engineering and technology may be popularized among the users of engineering college libraries and these resources may be subscribed to. Due to budgetary constrains many libraries are not able to procure the print versions of international or even national journals. As per All India Council of Technical Education (AICTE) stipulations, each branch of engineering should have a minimum of six national and six international journals. Most of the libraries are struggling to meet this guideline. In this context consortia subscription of
electronic journals seems to be a viable alternative and all the engineering college libraries can consider this option.

8. All the libraries should provide reliable internet connections with considerable bandwidth. Necessary training may be provided to the users on how to search and find pertinent information across the internet. Users may be encouraged to use the internet for academic purposes and necessary monitoring system may be adopted to identify and prevent hackers or culprits. Web based information sources and services may be introduced in the libraries and users may be encouraged to use these resources. While introducing web based sources and services, users feedback may be sought and corrective measures may be taken based on this, if necessary.

9. Electronic resources like IEL Online, ASME, ASCE, Science Direct, Ei Compendex, J-Gate, Indian Standards Online, ACM Digital Library, MathSciNet, etc. may be subscribed. Most of these resources provide archival access along with the current subscription and it will be a boon to those faculty and students who are engaged in research activities.

10. For the purpose of automation of libraries, engineering colleges may be used common software as far as possible. Usage of common software will facilitate centralized cataloguing and other types of resource sharing possible. Uniformity in software will ensure easy and seamless data transfer among the libraries.

11. Digital libraries may be established along with the traditional libraries. A number of open software is available for this purpose. Greenstone Digital Library software and D-space are most popular among them. Using one of
these software, a digital library may be established by using project reports submitted by the faculty and students as primary collection.

12. Web sites of the college may be given adequate information about the libraries. If possible web OPAC facility may be incorporated in the websites. Library portals may be developed for integrating different data streams available in the library and to provide seamless access across these databases.

13. It is true most of the libraries are struggling to meet the requirements of their users with their own resources. In this context networking of engineering college libraries can be considered. This network can facilitate resource sharing in print documents as well as electronic documents. In order to make this network feasible, library should acquire basic infrastructural facilities like Servers, modems, internet connectivity etc.

14. A consortium of the engineering college libraries in the state should be formed so as to mutually benefit in the collection development, provision of information, manpower development etc. The main reason for forming a library consortium is to improve information resources and services to the library users and to gain financial benefits. Shared subscription to electronic resources is the main activity of a library consortium and it can be a viable solution in order to increase the access to electronic resources across institutions at a lower cost. The consortia-based subscription can be successfully deployed to meet the pressures such as diminishing budget, increased user’s demand and rising cost of electronic resources. The collective strength of consortia members facilitates the libraries to get
the benefit of wider access to electronic resources at affordable cost and at the best terms and conditions.

15. Based on the large number of suggestions/comments received from the users and librarians of engineering college libraries, a framework for the proposed consortium of engineering college libraries in Kerala is presented below. This framework does not incorporate a detailed cost based technical brief and implementation of the consortium.

6.4.1. Development of a Library Consortium for Engineering Colleges in Kerala

It is very clear from the analysis of the data collected and findings drawn out of the analysis that most of the engineering college libraries in Kerala are facing the problems of shrinking budget, ever-growing user requirements, unprecedented technological advancement especially in the field of Information storage and retrieval. They are struggling to procure required books and journals in order to meet the requirements of the user community. It is also clear that most of the libraries are in their infancy and do not have self reliant library and information centers to support the teaching-learning processes of their parent institutions. However, few libraries have good collection of print and digital information. If a library consortium for engineering colleges in Kerala is developed, it would be a real boon to all the participating libraries because information resources of rich libraries can be made available to poor libraries by pooling all the resources. The different aspects of the consortium like policy endorsement, objectives, structure, membership, funding, resources and services, management aspects, archival issues etc. are discussed below.
6.4.1.1. Policy Endorsement

It is crucial for the success of the proposal that there must be an endorsement of the policy at government level since many of the libraries under study are attached to Government Engineering Colleges or Aided Engineering Colleges. Hence it is mandatory to have a formal endorsement from the government for the formation of the proposed consortium. In order to share the resources of Self financing Colleges it is necessary to get endorsement from the parent body of the library. It is necessary for all the participating libraries to sign a Memorandum of Understanding (MOU) which clearly states the common objectives, constitution of consortium, modus operandi etc.

6.4.1.2. Objectives of the Consortium

The objectives of the proposed consortium must be well drafted. It should encompass the long term and short term goals of the consortium. The objectives set should include the following important ones;

1. to ensure continuous subscription of the journals selected for consortium
2. to encourage collection development in electronic format
3. to share technical expertise of library professionals
4. it should provide a platform for discussing and sharing professional issues and concerns
5. to reduce the unit cost of information purchased

6.4.1.3. Structure of the Consortium

The proposed consortium must be centrally organized. There must be a governing body comprising of all the chief librarians or chief information officers of participating libraries. One of them shall act as a chief coordinator on rotation basis. Separate bodies shall be formed for negotiation, technical aspects, publications, training etc.
The physical structure of the consortium shall be a distributed model with core collection on engineering and technology. Participating libraries may be developed as centers of excellence in a particular branch of engineering and online resources like e-journals, e-books, online databases etc. may be subscribed commonly.

![Figure 6.1](image)

**Figure 6.1**

**Structure of the Proposed Consortium of Engineering College Libraries**

It is seen from the figure 6.1 that participating libraries can develop local electronic resources and if they are selected as the center of excellence in a particular branch, they should focus on the development of collection on that particular branch. Consortium web portal should seamlessly integrate individual library servers and commercial databases subscribed by the consortium. If a user searches for a document and if it is available either in any
of the library servers or with commercial databases, user should get the information without any difficulty. Users need not be aware of the location of the required information. There should be a robust search interface and it should take care of the location of information.

![Diagram of the Consortium Administration]

**Figure 6.2**

**Structure of the Consortium Administration**

The hierarchical administrative structure of the proposed consortium is given in the figure 6.2. Governing body is the topmost decision making body of the consortium. Under this there is a chief coordinator to coordinate the routine and executive works of the consortium. There will be four distinct bodies for negotiating with publishers and other database aggregators, technical council would take care of technical aspects of the consortium, there is a publication council which takes care of the publication and marketing aspects of consortia products and training council will arrange training for library staff and users of
the consortia. Besides these it is suggested to constitute local administrative councils in all the participating libraries in order to monitor and coordinate the activities of the consortium.

6.4.1.4. Membership of the Consortium

1. Membership should be open to all technical libraries with collection restricted to engineering and technology
2. Libraries of R&D institutions like VSSC, Trivandrum, can be given membership in the proposed consortium
3. Libraries of polytechnics can be given membership

6.4.1.5. Funding of the Consortium

1. There must be an annual membership fee
2. Cost of the electronic resources subscribed must be shared equally
3. Non members can be given access on payment
4. It can take up consultancy on consortia
5. Information can be repacked and marketed according to the need of the external users for academic purpose.

6.4.1.6. Resources and Services

1. Resources must be limited to engineering domain only
2. Whether to share print resources among the participating libraries must be decided
3. It must enhance the knowledge base of participating libraries
4. Resources selected for the consortium must be useful to most of the participating libraries

6.4.1.7. Management Aspects

1. The proposed consortium must be user friendly
2. Participating libraries may be encouraged to use uniform software and hardware wherever possible
3. Consortium should have robust search interface
4. It should be made as a prerequisite that member libraries must have basic infrastructure facilities to join the consortium
5. It should create awareness among users and staff
6. Proper training programs must be conducted regularly for staff and users
7. Special technical staff be available for the maintenance of the consortium
8. Consortium security must be ensured by IP authentication, firewall installation etc.
9. Copy right issues must be addressed

6.4.1.8. Archival Issues

It seems that none of the Indian consortia have seriously considered archival aspects of electronic resources. It is well known that publishing industry is prone to mergers, cessation and stoppages. In such circumstances the libraries have no guarantee for archives of electronic resources they are getting through the consortium. Archiving of electronic resources has many issues and challenges and important among them are discussed below:

6.4.1.8.1. Permanent Accessibility: Usually publishers of electronic journals provide access privilege to their journals for the prescribed subscription period only. In this context it is significant to note that in the case of print subscription, the libraries will have the print copies of the journals subscribed in their collection, even after the libraries stop the subscription. But, in the case of electronic journals the things are entirely different. As long as we continue subscription we are permitted to access the archives. Once we discontinue subscription we won’t have access to archives including the period for which we
had subscription. However, some publishers like Springer arrange complimentary “limited perpetual” access to the subscribed content for one or two years and after expiry of complimentary access further access can be assured by paying a maintenance fee. Publishers of e-journals also have software-controlled mechanism for checking sequential downloading of the articles of a particular issue. Hence there is no scope for downloading an entire issue and storage of the same on a secondary storage media. In the case of discontinuing an electronic subscription, the library will have absolutely no issues of journals for the future use of their patrons.

6.4.1.8.2. Uncertainty of Publishing Industry: It is well known that publishing industry is prone to mergers, cessation and stoppages. In such circumstances the libraries have no guarantee for accessing archives of the e-journals. In addition, many publishers upload their gigantic digital contents with third party server firms and there is no clarity or assurance how long the arrangement will last.

6.4.1.8.3. Durability of the Media: Shorter life span of electronic media is another important issue of electronic archiving. The scientific journals are in existence for a long time in print medium and they are well preserved in libraries. Now the format is changed from print to digital. At present most of the e-journals are published in PDF format. As the technology advances, the present medium and format may change within a short span of time.

6.4.1.8.4. Technological Advances: Archival policy may also consider unprecedented pace of technological developments in hardware and software. Today’s software and hardware may be outdated tomorrow. Issues like interoperability and standards must be considered in this context. We must also
take security measures against unauthorized access either through password authentication or by IP authentication.

6.4.1.8.5. **Intellectual Property Right:** Copyright issue is another issue for Archives. Generally copyright of a journal article or document rests with the publisher of the document. When we subscribe to a digital content, we are only “licensed to access” that content during a particular period. We may or may not have rights to access that digital content in future. So, at the time of setting up of the Archives, issues of copyright have to be settled with the creators of digital contents.

It is hoped that the proposed consortium would be able to address the various issues mentioned above and this consortium would also add values to the existing information infrastructure of engineering colleges in Kerala.

6.5. **Suggestions for Further Research**

The investigator, while conducting the present study, could identify certain areas for further research. They are briefly discussed below:

1. Many studies were not conducted on the different aspects of the medical college libraries of the state. Hence in-depth studies may be conducted on various aspects like user requirements and the available infrastructure like hardware, software and physical facilities of the medical college libraries of the state.

2. Detailed studies may be conducted on digital library and Open Sources Software initiatives of the special libraries like engineering college libraries, medical college libraries, pharmacy college libraries etc.
3. Detailed studies may be carried out on the consortia activities of other sectors of libraries like academic libraries, public libraries etc. of the state.

4. Information seeking behaviour of the users of engineering college libraries and medical college libraries can be studied.

5. Impact of Information and Communication Technology on collection development and provision of information services in academic libraries of the state can be carried out.

6.6. Conclusion

The present study has achieved its aim of assessing the present status of engineering college libraries in Kerala. The study has provided a useful summary of the current state of affairs of the engineering college libraries of the state. It is found that information resources –traditional as well as digital- of engineering college libraries are below the expected level and most of the libraries are not providing sufficient electronic information resources and services. Internet and related services of engineering college libraries are not up to the expected level. Users are not satisfied with the provision of web based services like online databases, electronic journals, etc. The main reasons identified for this sorry state of affairs were lack of sufficient budgetary allocations, lack of modern infrastructure and lack of trained library professionals. In this context, the investigator has suggested for the development of a library consortium for engineering colleges in Kerala. It is hoped that many of the present problems and issues of the engineering college libraries in Kerala can be addressed and solved through this proposed consortium.