CHAPTER 6

SUMMARY OF FINDINGS, CONCLUSION AND SUGGESTIONS

Engineering college libraries are positioning to be the torchbearers and pathmakers of educational advancement by way of integrating knowledge systems and resources. The library professionals are required to do serious introspection on their roles, responsibilities and contributions. The present study aims at examining the challenges of the library professionals in the present information communication development and its impact on the engineering libraries. It deals with the challenges of library professionals in the area of library automation and electronic sources, Internet and networking, preservation of digital and paper-based materials, skills development needed for facing the present challenges and intellectual property rights and their importance for the future library management. The findings of the study are summarised in the following paragraphs.

6.1 GENERAL PROFILE OF LIBRARY PROFESSIONALS

65.92 per cent of the respondents constitutes male community and 34.08 per cent of the respondents belong to female community.

It has been found out that out of 223 respondents, 122 respondents (54.71 per cent) are in the age group of less than 30 whereas 73 respondents (32.74 per cent) are in the age group of 30 to 40. 20 respondents (8.97 per cent) are in the age group of 40 to 50 and 8 respondents (3.58 per cent) are in the age group of above 50.

Out of 223 respondents, 155 respondents (69.51 per cent) library professionals are married. Remaining 68 respondents (30.49 per cent) are unmarried.
88 respondents (39.46 per cent) have completed under-graduation degree, 79 respondents (35.43 per cent) have P.G. degree, and 19 respondents (8.52 per cent) have P.G. with M.Phil., degree. 16.59 per cent of the library professionals have not crossed even under-graduate level.

68 respondents (30.49 per cent) have the qualification of MLISc with M.Phil, 65 respondents (29.15 per cent) MLISc, 45 respondents (20.18 per cent) BLISc, 37 respondents (16.59 per cent) CLISc and, only 8 respondents (3.59 per cent) library professionals have the maximum qualification of MLISc and Ph.D.

Out of 223 respondents, 67 respondents (30.04 per cent) belong to Library Assistant category, 62 respondents (27.80 per cent) are librarians, 43 Assistant Librarians (19.28 per cent), 37 Professional Assistants (16.60 per cent) and 14 Deputy Librarians (6.28 per cent).

It clearly found that more than 50 per cent of the library professionals (50.67 per cent) have experience below 5 years. 67 respondents (30.04 per cent) have 6 to 10 years of experience. 33 respondents (14.80 per cent) have the experience between 11 and 15 years. A few library professionals (4.49 per cent) have maximum experience of 16 years and above.

Regarding the computer qualifications, 67 respondents (30.04 per cent) have completed the post-graduate diploma course. 51 respondents (22.87 per cent) have some diploma course in computer. Out of 223 respondents, 23 respondents (10.31 per cent), 20 respondents (8.97 per cent) hold a P.G. degree and U.G. degree qualification in computer respectively. 26 respondents (11.66 per cent) do not have any computer qualification.
6.2 BACKGROUND OF THE ENGINEERING COLLEGE LIBRARIES IN THE STUDY AREA

Majority of the 31 libraries (44.93 per cent) have 10 working hours (8 am to 6 pm). 27 libraries (39.13 per cent) have 12 working hours per day. Only 2.90 per cent of the libraries have 24 hours working time.

3 Engineering College libraries (4.35 per cent) have a collection of books below 10000. 11 libraries (15.94 per cent) have a total collection of 10001 to 20000. 13 libraries (18.84 per cent) have the total volume of 20001 to 30000. 5 libraries (7.25 per cent) have a collection of 40001 to 50000. About 26 libraries (37.68 per cent) have a total collection of 30001 to 40000. Only 11 libraries (15.94 per cent) have a total collection of 50001 and above.

20 libraries (28.99 per cent) have less than 1001 to 1500 users. 16 libraries (23.19 per cent) have the strength of 1501 to 2000 users. Only 9 libraries (13.04 per cent) have the strength of below 500 users which were started recently. 13 libraries (18.84 per cent) have the strength of users above 2000. 11 libraries (15.94 per cent) have the strength of users from 501 to 1000.

Nearly 57 libraries (82.61 per cent) do not have library committee. Remaining 12 libraries (17.39 per cent) have library committee.

39 engineering colleges (56.52 per cent) are located in the rural areas. Remaining 30 colleges (43.48 per cent) are based in the urban areas.

Almost 30 Engineering College Libraries (43.48 per cent) are located in a separate building. About 39 college libraries (56.52 per cent) are situated in the main building.
There is only one Government Engineering College (1.45 per cent) in the study area. There is only one (1.45 per cent) aided-private engineering college. Remaining 67 (97.10 per cent) colleges come under self-financing category.

46 libraries (66.67 per cent) are using bar code technology for their library operation. 23 libraries (33.33 per cent) have not yet used the bar code technology.

Almost 36 libraries (52.17 per cent), 47 libraries (68.12 per cent), 8 libraries (11.59 per cent) are having the electronic library, the digital library and the virtual library respectively. Remaining 33 libraries (47.83 per cent), 22 libraries (31.88 per cent), 61 libraries (88.41 per cent) do not have the electronic, the digital library and the virtual library respectively.

Out of 69 libraries, only 42 libraries (60.87 per cent) are fully computerised. 21 libraries (30.43 per cent) are partly computerised. Remaining 6 libraries (8.70 per cent) of the libraries have not been computerised.

14 libraries (20.29 per cent) have the air-conditioning facility. The majority of the 55 libraries (79.71 per cent) have not yet been air-conditioned.

About 63 libraries (91.30 per cent) and 42 libraries (60.87 per cent) have Online and CD-ROM databases. Some 6 libraries (8.70 per cent) and 27 libraries (39.13 per cent) do not have the Online and CD-ROM databases in their libraries.

Of the electronic sources, e-books are available in 55 libraries (79.71 per cent), e-journals in 46 libraries (66.67 per cent), e-standards in 42 libraries (60.87 per cent), education software in 51 libraries (73.91 per cent), engineering diagram in 59 libraries (85.51 per cent), engineering databases in 57 libraries (82.61 per cent), bibliographic databases in 60 libraries (86.96 per cent) encyclopedia in 63 libraries (91.30 per cent),
e-newspaper in 49 libraries (71.01 per cent) e-dictionaries in 43 libraries (62.32 per cent) and COMPENDEX in 56 libraries (81.16 per cent).

Majority of the libraries have Internet services with the search engines of Web Crawler in 54 libraries (78.26 per cent), Yahoo in all 69 libraries (100 per cent), Google 69 in all libraries (100 per cent), Lycos in 56 libraries (81.16 per cent), Harvest in 41 libraries (71.01 per cent) Altavista in 49 libraries (59.42 per cent), Infoseek in 51 libraries (73.91 per cent), Hotpot in 65 libraries (94.20 per cent), Netseek 43 libraries (62.32 per cent) and Open text in 43 libraries (62.32 per cent). Even though there are Internet facilities, some libraries do not provide the services of the Internet Search Engines like Metacrawler in 43 libraries (62.32 per cent) and Excite in 50 libraries (72.46 per cent).

Among 69 libraries, E-mail access is available in all 69 libraries (100 per cent). List Servers are available in 54 libraries (78.26 per cent) and not available in 15 libraries (21.74 per cent). UseNet/News groups is used in 49 libraries (71.01 per cent) and not used in 20 libraries (28.99 per cent). Telnet service is available in 45 libraries (65.22 per cent) and not available in 24 libraries (34.78 per cent). File Transfer Protocol is progressed in 53 libraries (76.8 per cent) and not progressed in 16 libraries (23.19 per cent) Archie is available in 57 libraries (82.6 per cent) and not available in 12 libraries (17.39 per cent). Gopher and MOSAIC are available in 55 libraries (79.71 per cent) and not available in 14 libraries (20.29 per cent). Veronica is available in 59 libraries (85.51 per cent) and not available in 10 libraries (14.49 per cent).
All the 69 engineering libraries have 100 per cent availability of Audio-Visuals, CD, DVD, Web Camera, Telephone, Computer, Projector / OHP and Television facilities. Only 63.77 per cent of the libraries have the Online Video conferencing facility.

Among 69 libraries, Bus Network is followed by 30 libraries (43.49 per cent), Star Network by 12 libraries (17.39 per cent) and Hierarchy Network by 9 libraries (13.04 per cent). 8 Libraries (11.59 per cent) do not have LAN Network.

Among 69 libraries, Public Switched Telephone is available in 57 libraries (82.61 per cent), Public Data Networks in 24 libraries (34.78 per cent), Satellite Data Network in 23 libraries (33.33 per cent), Network of Leased Lines in 8 libraries (11.59 per cent) and Integrated Service Digital Network in 53 libraries (76.81 per cent).

Majority of the libraries have computerised their house-keeping operation. 63 libraries (91.30 per cent) have acquisition, circulation, serial control and library administration through the computer system. About 27 libraries (39.13 per cent) have not been computerised yet in the areas of cataloguing bibliographic service and finance. Some 6 libraries (8.70 per cent) have not been fully been computerised.

6.3 CHALLENGES IN LIBRARY AUTOMATION AND ELECTRONIC SOURCES

Among 223 respondents, only 75 respondents (33.63 per cent) library professionals have knowledge to create the library software independently. Some of 25 respondents (11.21 per cent) have some knowledge of creating library software. Majority of the 123 respondents (55.16 per cent) do not have the knowledge of creating the library software independently.
Majority of the 189 respondents (84.75 per cent) have awareness in INDEST, 178 respondents (79.82 per cent) in CSIR E-Journal Consortium, 156 respondents (69.96 per cent) in UGC-INFONET and 64 respondents (28.70 per cent) in IUC-DAEF and 102 respondents (45.74 per cent) in FORSA. Even though there is much facility to know about these consortia, some professionals 34 respondents (15.25 per cent) do not have awareness of e-journal Consortia in INDEST, 121 respondents (54.26 per cent) in FORSA, 159 respondents (71.30 per cent) in IUC-DAEF, 45 respondents (20.18 per cent) in CSIR E-Journal Consortium and 67 respondents (30.04 per cent) in UGC – INFONET.

Majority of the 116 respondents (52.02 per cent) have ‘problems in accessing suitable personal computer’, 146 respondents (65.47 per cent) ‘problems with accessing suitable software’, 173 respondents (77.58 per cent) ‘problems with accessing external networks for e-mail or Internet’, 145 respondents (65.02 per cent) in ‘lack of time to acquire skills needed to use’, and 141 respondents (63.23 per cent) in ‘lack of high quality information available from digital resources’. Even though the library professionals felt a lot of problems, a few 107 respondents (47.98 per cent) have opined that they have no ‘problems with accessing suitable personal computer’, 77 respondents (34.53 per cent) ‘problems with accessing suitable software’, 82 respondents (36.77 per cent) have the problem of ‘lack of high quality information available from digital resources’, and 172 respondents (77.13 per cent) have a ‘feeling that electronic resources are not relevant to the library user’s need’.

24 respondents (55.60 per cent) have knowledge in E-books, 117 respondents (52.47 per cent) in E-Journals, 119 respondents (53.36 per cent) in E-standard, 120 respondents (53.81 per cent) in E-Reports, 111 respondents (49.78 per cent) in
Engineering Diagram, 120 respondents (53.81 per cent) in Engineering Databases, 102 respondents (45.74 per cent) in Bibliographic Databases and 108 respondents (48.43 per cent) in COMPENDEX. Even though there are a lot of electronic sources in the library, some of the 99 respondents (44.60 per cent) do not have knowledge in E-Books, 106 respondents (47.53 per cent) in E-Journals, 104 respondents (46.64 per cent) in E-Standards, 104 respondents (46.19 per cent) in E-Reports, 104 respondents (45.64 per cent) in Education software, 112 respondents (50.22 per cent) in Engineering diagram, 103 respondents (46.19 per cent) in Engineering databases, 121 respondents (54.26 per cent) in Bibliographic databases and 115 respondents (51.57 per cent) in COMPENDEX.

Based on the opinion of the respondents, ‘Forces the complete retraining of personnel ranks first and scores 809 points. ‘Reducing repetitive work’ gets the second rank in automation which scores 775 points. ‘Replacing the manual technical services’ is the third impact in ranking and scores 779 points. ‘Upgrade the skills of the supervisory staff’, (765 points), ‘Generating data whenever required’ (664 points), Reducing the quality of interpersonal communication skills (663 points) and ‘getting variety of output from single input’ (662 points) rank fourth to seventh in the opinion on the impact of library automation.

Out of eight problems designed by the investigator, ‘Funds’ is the foremost problem which ranks first scoring 788 points. ‘Management decision’ ranks second, scoring 733 points. ‘Motivation and training the staff’ ranks third scoring 719 points. The other problems ‘Selection of infrastructure, equipment and software’ (711 points), ‘Technical problems’ (707 points), ‘Training the user’ (706 points),
‘Non-co-operation of staff’ (685 points) and ‘Retrospective conversion of existing information’ (678 points) stand fourth to eighth in ranking.

6.4 CHALLENGES IN NETWORKING AND INTERNET

99 respondents (44.39 per cent) have e-mail user ID and 124 respondents (55.61 per cent) do not have e-mail user ID. Even though they have some knowledge of the Internet, majority of the library professionals (55.56 per cent) do not have the e-mail user ID.

The highest percentage of library professionals (77.58 per cent) have the knowledge of operating E-mail. But it is not even known to 22.42 per cent of the library professionals. Next to that 74.89 per cent of the library professionals know the operation of World Wide Web whereas 25.11 per cent of the library professionals do not have the knowledge about World Wide Web. Between 40-50 per cent of library professionals have the knowledge of List Servers, Wide Area Information System, Usenet/News Group. The other Internet services like File Transfer Protocol Archie, Gopher, Veronica are used by below 40 per cent of library professionals. The least known is the MOSAIC. Only 20.18 per cent of the library professionals have the knowledge to operate the MOSAIC independently.

Observing the knowledge of library professionals in OPAC, 119 respondents (53.36 per cent) have knowledge in OPAC of OCLC and 119 respondents (53.36 per cent) in OPAC of Indian Universities. Majority of the 134 respondents (60.09 per cent) do not have the knowledge of OPAC of British Library, 132 respondents (59.19 per cent) in OPAC of both information and service, and 121 respondents (54.24 per cent) in OPAC of LC.
Google and Yahoo are the most used Internet search engines of library professionals (100 per cent). Next to these two search engines, 135 respondents (60.54 per cent) have knowledge of Web Crawler. Majority of the respondents 147 (65.92 per cent) do not have knowledge of Lycos, 146 respondents (65.47 per cent) in Harvest, 162 respondents (72.65 per cent) in AltaVista, 157 respondents (70.40 per cent) in Infoseek, 145 respondents (65.02 percent) in Hotbot, 161 respondents (69.96 per cent) in Excite, 161 respondents (72.20 per cent) in Netseek, 159 respondents (71.30 per cent) in Meta Crawler and 153 respondents (68.61 per cent) in Open Text.

Regarding knowledge of internet technology 149 respondents (66.82 per cent) have awareness of Web Conferencing. The survey result shows that out of 223 respondents, 115 respondents (51.7 per cent) have awareness of emerging technologies in Blogs (51.5 per cent), 119 respondents (53.36 per cent) in Wikis and 149 respondents (66.82 per cent) in Web conferencing. Majority of the 132 respondents (59.19 per cent) do not have awareness in the emerging technology in RSS aggregators, 118 respondents (52.91 per cent) in Podcasts, 134 respondents (60.09 per cent) in Vodcasts, 147 respondents (65.92 per cent) in Social Network, 145 respondents (65.02 per cent) in Semantic web and 133 respondents (59.64 per cent) in Virtual library services.

Out of five Internet uses, ‘research project sites’ get the first rank scoring 789 points. ‘Scholarly paper and abstracts’ ranks second scoring 778 points. ‘Online electronic Journals’ gets third rank which scores 768 points, ‘Academic websites on Internet’ (757 points) and ‘Downloading of files’ (751 points) rank fourth and fifth in the usefulness of the Internet.
74 respondents (33.18 per cent) have knowledge in NICNET, 91 respondents (40.81 per cent) in INDONET, 79 respondents (35.43 per cent) in DELNET, 56 respondents (25.11 per cent) in INFLIBNET, 67 respondents (30.04 per cent) in MALIBNET. Majority of the 149 respondents (66.82 per cent) do not have enough knowledge in NICNET, 167 respondents (74.89 per cent) in INFLIBNET, 144 respondents (64.57 per cent) in DELNET, 132 respondents (59.19 per cent) in INDONET and 156 respondents (69.96 per cent) in MALIBNET.

The library professionals felt that ‘Improper network management‘ ranks first among the eight challenges, with a score of 810 points. The challenge ‘Low level of knowledge in network’ is in the second rank which scores 786 points. The third rank goes to the challenge ‘No technical skill development of the library professionals’ which scores 781. The other challenges ‘Mismanagement of Network application software’ (773 points), ‘Decrease in sharing the resources’ (770 points), ‘Not understanding network design’ (758 points), ‘No proper skill development’ (752 points) and ‘Needed proper training.

Regarding the impact of Internet in the library, ‘Slow access’ is in the first rank which scores 828 points. Another problem ‘Laziness’ ranks second scoring 822 points. The third problem is ‘Impermanence of information on the Web’ which scores 808 points. The remaining problems such as ‘Overloaded information’ (800 points), ‘Lack of quality information’, (794 points), ‘Decrease in skills’ (785 points), ‘Internet caused depression’ (781 points), ‘Privacy problems’ (775 points), ‘Dishonesty’ (753 points), ‘Downloading PDF files takes more time’ (722 points) and ‘Irrelevant information’ (673 points) get fourth to eleventh ranks respectively in networking’ get fourth to eighth rank respectively.
6.5 CHALLENGES IN PRESERVATION OF LIBRARY COLLECTIONS

The majority of the respondents have the knowledge on the environmental enemies of preservation — 137 respondents (61.44 per cent) in Temperature, 120 respondents (53.81 per cent) in Humidity, 117 respondents (52.47 per cent) in Light, 129 respondents (57.85 per cent) in Biological Infestation, 178 respondents (79.82 per cent) in Pollution (Dust) and 88 respondents (39.46 per cent) in Natural Disasters. Remaining 86 respondents (38.56 per cent) do not have the knowledge on the environmental enemies of the preservation in Temperature, 103 respondents (46.19 per cent) in Humidity, 106 respondents (47.53 per cent) in Light, 94 respondents (42.15 per cent) in Biological Infestation, 45 respondents (20.18 per cent) in Pollution (Dust) and 135 respondents (60.54 per cent) in Natural Disaster.

As for the awareness of the library professionals about the restoration methods of preservation, 107 respondents (47.98 per cent) have the awareness in the various methods in Mending, 164 respondents (73.54 per cent) in Repacking, 114 respondents (51.12 per cent) in Recovering, 176 respondents (78.92 per cent) in Re-sewing, 109 respondents (48.88 per cent) in De-acidification and 118 respondents (52.91 per cent) in De-accessioning. Majority of the library professionals do not have awareness of Mending (52.02 per cent), Recasting (60.99 per cent) and De-acidification (51.12 per cent).

28 respondents (12.56 per cent) have the knowledge of Technology preservation, 66 respondents (29.60 per cent) in Technology emulation, 78 respondents (34.98 per cent) in Information migration, 94 respondents (42.15 per cent) in Encapsulation and 47 respondents (21.09 per cent) in Reformatting. Majority of the library professionals do not have much knowledge on Technology preservation.
(87.44 per cent), Technology emulation (70.40 per cent), Information migration (65.02 per cent), Encapsulation (57.85 per cent) and Reformatting (78.92 per cent).

Out of six problems, ‘Unauthorized tampering with data’ got the first slot and the score is 811 points. This is a very serious problem of the library professionals in digital preservation. The second one is ‘Electronic data in form that cannot be preserved’ got the second rank which scores 713, the third is ‘Uncontrolled accumulation of data’ which has 706 points, ‘Lack of meta data systems and documentation’ (690 points), ‘Lack of empowering mechanism for preservation’ (645 points) and ‘Inadvertent destruction of data’ get the fourth, fifth and sixth rank respectively.

Regarding the preservation of electronic publishing materials, 116 respondents (52.02 per cent) have awareness in CD-ROM preservation, 119 respondents (53.36 per cent) in Magnetic tape and diskettes, 113 respondents (50.67 per cent) in Network publishing, 145 respondents (65.02 per cent) in Journal publishing and 118 respondents (52.91 per cent) in learning materials preservation. The majority of the library professionals do not have awareness of electronic books (56.25 per cent) electronic mail (57.57 per cent), Electronic Journals (65.92 per cent), Bulletin boards (74.89 per cent), and Document Delivery (50.67 per cent).

169 respondents (75.78 per cent) have the awareness in the preservation of the digital resources in data sets, 161 respondents (72.20 per cent) in structural texts, 119 respondents (53.36 per cent) in design data, and 141 respondents (63.23 per cent) in presentation graphics. But in a few cases, the majority of the library professionals do not have knowledge of the digital resources of visual images (60.54 per cent), engineering graphics (60.99 per cent), engineering diagrams (60.09 per cent), speech
and sound recordings (57.85 per cent) and interactive multimedia publication (52.47 per cent).

In respect of the respondents’ opinions, ‘Better location’ got the first rank in the order scoring 754 points. The second one is regulated electrical power supply scoring 719 points. The media protection is in the third rank getting 715 points. Fire protection (707 points) moderate temperature and humidly control (668 points) and ventilated room (609 points) rank fourth, fifth and sixth respectively.

6.6 CHALLENGES IN SKILLS DEVELOPMENT FOR MODERN LIBRARY

It is found that 197 respondents (88.34 per cent) library professionals are computer literates. Out of 223 respondents, about 11.66 per cent of the respondents do not have computer literacy.

Only 56 respondents (25.11 per cent) are well-versed in using the computer peripherals. About 109 respondents (48.88 per cent) respondents have knowledge to use the computer to some extent. 11 respondents (26.01 per cent) have very little knowledge about the computer.

Some of the respondents have given the positive opinion: 91 respondents (40.81 per cent) in the area of strategic planning, 74 respondents (33.18 per cent) in financial planning and management, 53 respondents (23.77 per cent) in HRD Management, 87 respondents (39.01 per cent) in Communication skills, 108 respondents (48.43 per cent) in Leadership skills, 89 respondents (39.91 per cent) in Project management and 96 respondents (43.05 per cent) in Marketing skills. Majority of the 132 respondents (59.19 per cent) lack the skills in the area of Strategic planning, 149 respondents (66.82 per cent) in Financial planning and management, 170
respondents (76.23 per cent) in HRD management, 136 respondents (60.99 per cent) in Communication skills, 115 respondents (51.37 per cent) in Leadership skills, 134 respondents (60.09 per cent) in Project management and 127 respondents (56.95 per cent) in marketing skills.

Out of 223 respondents, only 69 respondents (30.94 per cent) have necessary skills in Computer hardware acquisition and management, 43 respondents (19.28 per cent) in Data design, 135 respondents (60.54 per cent) in Database management, 101 respondents (45.29 per cent) in Telecommunication system, 112 respondents (50.22 per cent) in System Auditing, 94 respondents (42.15 per cent) in Information service and management and 66 respondents (29.60 per cent) in Application development management. Majority of the respondents do not have the necessary technical skills: 180 respondents (80.72 per cent) in the area of Data design, 154 respondents (69.04 per cent) in computer hardware acquisition and management, 122 respondents (54.71 per cent) in Telecommunication system, 129 respondents (57.85 per cent) in Information service management and 157 respondents (70.40 per cent) in Application development management.

Out of 223 library professionals, 134 respondents (60.09 per cent) have knowledge base in the PC packages, 109 respondents (48.88 per cent) in data administration, 92 respondents (41.26 per cent) in system software, 78 respondents (34.98 per cent) in library packages and 96 respondents (43.05 per cent) in application software. 145 respondents (65.02 per cent) do not have sufficient knowledge base in library packages, 131 respondents (58.74 per cent) in system software, 127 respondents (56.95 per cent) in application software and 114 respondents (51.12 per cent) in data administration.
Majority of the 78 respondents (34.98 per cent) have skills in Internet navigation, browsing, and filtering, 66 respondents (29.60 per cent) in Websites-retrieving, accessing, downloading and searching databases in websites, and 100 respondents (44.84 per cent) in e-mail creating, searching, sending and chatting messages. A large number of respondents do not have sufficient skills in the Internet (65.02 per cent), websites (70.40 per cent) and e-mail (50.67 per cent) in the Internet technologies.

88 respondents (39.46 per cent) have skill in networks in archiving digital documents, 84 respondents (37.67 per cent) in locating digital sources, 116 respondents (52.02 per cent) in printing techniques, 91 respondents (40.81 per cent) in digital presentation and storage, 76 respondents (34.08 per cent) in connecting skills and 82 respondents (36.77 per cent) in Inter-operatability. Out of 223 respondents, 135 respondents (60.54 per cent) do not possess skills in archiving digital documents, 139 respondents (62.33 per cent) in locating digital sources, 132 respondents (59.19 per cent) in digital presentation and storage, 147 respondents (65.92 per cent) in connecting skills and 141 respondents (63.23 per cent) in Inter-operatability of the networks.

80 respondents (35.87 per cent) have the skills in the area of searching skills in indexes, 84 respondents (37.67 per cent) in abstracts against keywords, 77 respondents (34.53 per cent) in Boolean logic, 99 respondents (44.39 per cent) in truncation, 79 respondents (35.43 per cent) in literary to install CD-ROM and 91 respondents (40.81 per cent) in interfacing online and off ramps. Majority of 143 respondents (64.13 per cent) do not have the searching skills in indexes, 139 respondents (62.33 per cent) in abstracts against keywords, 146 respondents (65.47 per cent) in Boolean logic, 124
respondents (55.61 per cent) in truncation, 144 respondents (64.57 per cent) in literacy to install CD-ROM, and 132 respondents (59.19 per cent) in Interfacing online and off ramps.

Out of 223 respondents, 26.91 per cent of the library professionals have skills in creating and maintaining OPACS, 43.95 per cent respondents in Digital preservation, 45.74 per cent in Electronic Storage, 36.63 per cent respondents in knowledge of Library Automation and 33.18 per cent respondents in Design and Development of library databases. Majority of the respondents do not have skills in creating and maintaining OPACS (73.09 per cent), Digital preservation (56.05 per cent), Electronic storage (54.26 per cent), knowledge of Library Automation (66.37 per cent) and Design and Development of library databases (66.82 per cent).

The library professionals have the skills in Multimedia indexing (43.95 per cent), Revival of text images and other multimedia objects (25.11 per cent), Image processing (30.04 per cent), Object-oriented processing (14.80 per cent), Speech recognition (34.98 per cent), Advanced processing capabilities of exploiting digital medium (20.63 per cent), Creating, maintaining indexes and OPACs (31.84 per cent) and Interactive digital communications and visualizations (30.04 per cent). Majority of the library professionals do not have skills in Multimedia indexing (56.05 per cent), Searching revival of text images and other multimedia objects (74.89 per cent), image processing (69.96 per cent), Object-oriented processing (85.20 per cent), Speech recognition (65.02 per cent), Advanced processing capabilities of exploiting digital medium (79.37 per cent), Creating, maintaining indexes and OPACs (68.16 per cent) and Interactive digital communications and visualizations (69.96 per cent).
Out of 223 respondents, 49.33 per cent of the respondents have skills in input of systems data resources in the area of digital information systems. 45.74 per cent of the respondents have the skills in digital technology. 48.43 per cent of the library professionals have the skills in DT media processing. About 43.95 per cent and 40.81 per cent of the respondents have the skills in hardware equipment tools and telecommunication system respectively. Majority of the respondents 113 respondents (50.67 per cent) in Digital information systems, 121 respondents (54.26 per cent) in digital technology, 115 respondents (51.57 per cent) in DT media processing, 125 respondents (56.05 per cent) in hardware equipment tools, 132 respondents (59.19 per cent) in telecommunication system and 147 respondents (65.92 per cent) in Training support for DT do not have the skills in the digital information systems.

About 109 respondents (48.88 per cent) of the respondents have skills in the area of virus protection. Only 94 respondents (42.15 per cent) respondents have skills in the security of data in comprehensive scanning of virus. 114 respondents (51.42 per cent) do not have skills in virus protection and 129 respondents (57.85 per cent) in security of data.

Out of 10 qualities needed for the library professional in the modern era, ‘Flexibility’ ranks first with a total of 798 points. The quality ‘Appreciation’ ranks second with a total of 796 points. The quality ‘Broad education’ ranks third scoring of 789 points. ‘Communication skills’ gets the 4th rank, ‘Willingness to speed up modern techniques’ 5th rank, ‘Tolerance of change’ 6th rank, Curiosity 7th rank, Stubborn pragmaticism 8th rank, Sense of humour 9th rank and fund-raising capacity 10th rank.
6.7 CHALLENGES IN COPYRIGHT AND INTELLECTUAL PROPERTY RIGHTS

138 respondents (61.89 per cent) of the respondents do not have knowledge of the intellectual property rights system. Remaining 85 respondents (38.11 per cent) have awareness of the intellectual property rights system.

215 respondents (96.41 per cent) do not have the knowledge of the current and proposed technologies in fractional access, 217 respondents (97.31 per cent) in control of interface, 198 respondents (88.79 per cent) in hardware locks, 212 respondents (95.07 per cent) in repositories, 218 respondents (97.76 per cent) in steganography, 216 respondents (96.86 per cent) in Cryptolopes, 195 respondents (87.44 per cent) in special hardware, 199 respondents (89.24 per cent) in economic approaches, 209 respondents (93.72 per cent) in flickering and 145 respondents (65.02 per cent) in digital watermarking.

54 respondents (24.22 per cent) have given favourable responses on the awareness in Designs Act, 102 respondents (45.74 per cent) in Copyright Act, 113 respondents (50.77 per cent) in Copyright Rules, 119 respondents (53.36 per cent) in Trade Marks, 83 respondents (37.22 per cent) in Patents Act and 111 respondents (49.78 per cent) in Communication Act. 169 respondents (75.78 per cent) do not have the knowledge in Designs Act, 121 respondents (54.26 per cent) in Copyright Act, 110 respondents (49.33 per cent) in Copyright Rules, 104 respondents (46.64 per cent) in Trade marks, 140 respondents (62.78 per cent) in Patents Act, and 112 respondents (50.22 per cent) in Communication Act respectively.

53 respondents (23.77 per cent) have awareness in software tampering, 29 respondents (13.01 per cent) in reverse engineering of software products, 35 respondents (15.70 per cent) in Piracy, 27 respondents (12.11 per cent) in Unrestricted
client access, 33 respondents (14.80 per cent) in Commercial use of noncommercial resource, 34 respondents (15.25 per cent) in Counterfeiting, 66 respondents (29.60 per cent) in CD-ROM piracy and 57 respondents (25.56 per cent) in Internet piracy. Majority of the library professionals do not have awareness in the software tampering (76.23 per cent), reverse engineering of software products (86.99 per cent), Piracy (84.30 per cent), unrestricted client access (87.89 per cent), Commercial use of non-commercial resource (85.20 per cent), Counterfeiting (84.75 per cent), CD-ROM piracy (70.40 per cent) and Internet piracy (74.44 per cent).

Majority of the 199 respondents (89.24 per cent) opine that there are tough challenges in knowing the intellectual property rights issues. Only 24 respondents (10.76 per cent) felt that there are no challenges in knowing the intellectual property rights issues.

About 108 respondents (48.43 per cent) have awareness of the copyrights system. Remaining 115 respondents (51.57 per cent) do not have awareness of the copyrights system.

Majority of the 177 respondents (79.37 per cent) felt that there is urgent need to know about the importance of the copyright system. Some of the 25 respondents (11.21 per cent) opined that there is no need to know about the importance of the copyright system. Remaining 21 respondents (9.42 per cent) do not know the importance of the copyright system needed for the engineering college libraries.

78.92 per cent of the respondents felt that there is a need to create the awareness among the users on the IPR and copyright system. 28 respondents (12.56 per cent) opined that there is no need to create the awareness on the IPR and copyright system.
Remaining 19 respondents (8.52 per cent) do not know the importance of creating the awareness of the IPR and copyright system among the users.

94 respondents (42.15 per cent) have awareness of the patent law of the IPR issues. Remaining 129 respondents (57.85 per cent) do not have awareness of the patent law.

98 respondents (43.54 per cent) opined that censorship is needed for the libraries. About 89 respondents (39.91 per cent) opined that there is no need to have the policy of censorship in the library. Remaining 36 respondents (16.14 per cent) do not know about the censorship in the library.

6.8 TESTING OF HYPOTHESES

Testing of hypothesis. There is no significant difference of opinion among the library professionals in the emerging technologies in the Internet.

The calculated Chi-square values are less than the table value in RSS Aggregators, Web Conferencing, Consortia, R3 Access, and Virtual Library Services. The hypothesis is accepted in the Internet emerging technologies in RSS Aggregators, Web Conferencing, Consortia, R3 Access, and Virtual Library Services. Hence the researcher concludes that there is no significant difference in the opinion in the Internet emerging technologies in RSS Aggregators, Web Conferencing, Consortia, R3 Access, and Virtual Library Services.

In a few cases, the calculated Chi-square values are greater than the table value in the opinion of emerging technologies in Blogs, Wikis, Podcasts, Vodcasts, Instant Messaging, Social Network, Semantic Web and Cloud Computing. Hence the

The researcher concludes that there is significant difference on the opinion in the emerging technologies of Blogs, Wikis, Podcasts, Vodcasts, Instant Messaging, Social Network, Semantic Web and Cloud Computing.

Testing of Hypothesis: There is no significant difference of opinion among Library professionals about the managerial skills required for the present library management.

It is found that all the calculated values of chi-square are less than the table value. The hypothesis is accepted. Hence the researcher concludes that there is no significant difference on the managerial skills such as strategic planning, financial planning and management, HRD management communication skills, leadership skills, project management and marketing skills in the present day library management.

Testing of hypothesis. There is no significant difference of opinion among the library professionals in the technical skills required for the computerised environment in the library.

The calculated chi-square values are less than the table value in data design telecommunication system information service and management and application development management. The hypothesis is accepted in these four factors. Hence the researcher concludes that there is no significant difference in the opinion in the technical skills of in data design telecommunication system information service and management and application development management.
In a few cases, the calculated chi-square values are greater than the table value in the opinion of computer hardware acquisition and management, database management and system auditing of the technical skills required. Hence the hypothesis is rejected in computer hardware acquisition and management, database management and system auditing. The researcher concludes that there is significant difference in the opinion of library professionals in computer hardware acquisition and management, database management and system auditing of the technical skills required.

**Testing of Hypothesis:** There is no significant difference of opinion among Library professionals about the knowledge intellectual properties rights.

It is found that the calculated values of Chi-square values are greater than the table value. Hence the hypothesis is rejected. The researcher concludes that there is significant difference in the opinion among the library professionals towards knowledge about intellectual property rights.

**Testing of Hypothesis:** There is no significant difference of opinion among Library professionals about the knowledge of current and proposed technologies for protecting intellectual properties.

It is found that the calculated values of chi-square are significant in fractional access, control of interface, hardware locks, repositories, steganography, cryptopoles, special hardware, economic approaches, flickering and digital watermarking. All calculated chi square value is less than the table value. Hence, the researcher concludes that there is no significant difference in the opinion among the library professionals on the knowledge of current and proposed technologies for protecting intellectual properties.
Testing of Hypothesis: There is no significant difference of opinion among Library professionals about the challenges in knowing the intellectual property rights system existing in the country.

It is found that the calculated value of Chi-square is less than the table value. The hypothesis is accepted. Hence the researcher concludes that there is no significant difference in the opinion among the library professionals about the tough challenges in knowing the intellectual property rights system existing in the country.

Testing of hypothesis. Library professionals do not have significant difference of opinion in the awareness on possible threats to the intellectual properties contained in digital resources.

The calculated chi-square values are less than the table value in software tampering, unrestricted client access, commercial use of noncommercial resource and counterfeiting. The hypothesis is accepted in these four factors. Hence the researcher concludes that there is no significant difference in the opinion in the awareness on possible threats to the intellectual properties contained in digital resources.

In few cases, the calculated Chi-square values are greater than the table value in the opinion of reverse engineering of software products, Piracy, CD-ROM piracy and Internet piracy. The hypothesis is rejected in these four factors. The researcher concludes that there is significant difference in the opinion of library professionals in Reverse engineering of software products, piracy, CD-ROM piracy and Internet piracy.

Testing of Hypothesis: There is no significant difference of opinion among Library professionals about awareness in the copyrights system of existing in the country.
It is found that the calculated value of chi-square is greater than the table value. The hypothesis is **rejected.** Hence the researcher concludes that there is significant difference on the opinion among the library professionals about copyrights system existing in the country.

**Testing of Hypothesis:** There is no significant difference of opinion among Library professionals in creating awareness among users about IPR and copyright in the library.

It is found that the calculated value of Chi-square is less than the table value. The hypothesis is **accepted.** Hence the researcher concludes that there is in significant difference on the opinion among library professionals in creating awareness among users about IPR and copyright in the library.

**Testing of Hypothesis:** There is no significant difference of opinion among library professionals about awareness in the patent law of existing in the country.

It is found that the calculated value of Chi-square is greater than the table value. The hypothesis is **rejected.** Hence the researcher concludes that there is significant difference in the opinion among library professionals about awareness in the patent law of existing in the country.

**Testing of Hypothesis:** There is no significant difference of opinion among library professionals about necessity of the censorship in the engineering college libraries.

It is found that the calculated value of Chi-square is greater than the table value. The hypothesis is **rejected.** Hence, the researcher concludes that there is significant
difference in opinion among the library professionals towards necessity of censorship for engineering college libraries.

6.9 DISCUSSION ON FINDINGS OF THE STUDY

The present study is conducted to examine the challenges of library professionals in the area of electronic sources and services, library automation, problems of library professionals in internet and networking, preservation of library materials, skill development and protections of intellectual property rights. A study of these challenges has become important due to adoption of e-services by the library professionals in addition to traditional human services. The present study has revealed that library automation is important for easy retrieval of the information and college authorities must build up the automation services for the users. This finding is similar to the findings of Sadanand and Shamin (2008). Libraries, librarians, and college administrators must initiate automation in order to provide effective and efficient services to the users. The findings of the problems and challenges in library automation by Husain and Ansari, (2007), Matoria and Ram Kumar, (2007) Mulla and Chandrashekara (2006), are relevant, which deals with the application of information technology in libraries, one of the greatest challenges before the library managers.

The present study discloses that a lot of problems in Internet while providing information service in the library. This finding is confirmed by the findings of Jange, Suresh and Koganuramath (1998) about the increasing pressure on librarians to cope up with these new challenges and changing users’ needs.
The present study has unravelled various preservation techniques. The problems faced by the library professionals in this area are listed out in the study. This is similar to the studies which enlist the challenges faced by the academic libraries in preservation by Jagtar Singh (2009) major challenges in choosing methods from analog to digital conversion by Mani (2009) and Samir Chattopadhyay (2006) the importance and need of preservation of information resources in libraries Kademani et.al., (2003).

Another important finding in the study is the challenges of library professionals in the skill development needed for the modern information communication technology. It shows various competencies and skills needed by the library professionals, which are analogous to the competencies, challenges and new roles dealt with by Maitrayee Ghosh (2009), present and desired level of competencies of college librarians studied by Ally Sornam and Prakatheswaran (2008), skills for library and information professionals working in borderless library analysed by Nirmal Ranjan Razumdar (2007), and the need for library and information professionals today to acquire knowledge and skills in information and communication technology (ICT) to render effective the services especially in educational institutions stressed by Ramesh Babu et.al., (2007), Dinesh and Khaiser Nikam (2007) and Gayatri Mahapatra1 (2006).

Some of the findings of the present study regarding the intellectual property rights with the studies, the present study is in accordance with the Intellectual Property Right in Indian scenario by Rupak Chakravarty (2010), the awareness of the digital watermarking by Natarajan and Gayas Makhdumi (2009), patent illiteracy and awareness by Ramesh (2004), copyright protection by Satarkar (2002), Copyright law
by Kala Thairani (1998). Some of the previous research findings are same in accordance with present study.

6.10 IMPLICATIONS OF THE STUDY

The findings of the study have vast implications for the planners of higher education, administrators and the library professionals of engineering college libraries in facing various challenges in the area of Information Communication Technology while applying it in the engineering libraries. Results of the present study show the various challenges met by the library professionals irrespective of their technical as well as professional education. It proves that development in the area of computer field poses challenges in the library. Providing e-services and sources to the user community in the engineering college is the biggest challenge for the present day library professionals. This study clearly exposes the challenges to the library professionals. Library professionals have to be equipped to implement the new communication technologies in the modern libraries. The present study is an eye opener to the concerned engineering college libraries and others for tackling problems in the area of modern library techniques. The level of users’ awareness in e-sources has necessitated the role of library professionals to be redefined in the context of e-environment.

The present study highlights the various aspects of e-resources, library automation, preservation techniques, Internet and networking, skills needed and intellectual property rights with modern library management. The present study underscores the recent developments which offer many exciting challenges and opportunities to enhance and expand information and access information to the clientele in the engineering college libraries. Electronic resources are increasingly acquired in these libraries, particularly those available in web enabled medium. Hence,
knowledge is essential to those who are in the information-handling profession. The present study emphasizes that high-tech knowledge of library professionals in operating Internet services is essential for enabling the users to get relevant information from Internet.

Every Library professional has to be aware of the responsibility of the preservation of the library collections. Most of the library professionals lack computer literacy and the result is that computer professionals are pre-dominating the library and information systems in every aspect of handling electronic media. The technical skills such as computer hardware acquisition and management, data design, database management telecommunication system, system auditing, information service and development management are essential for the present information communication technology. The study also brings out the exponential growth of scientific knowledge, increasing demand for new forms of intellectual property protection as well as access to intellectual property related information, and increasing dominance of the new knowledge economy over the old brick and mortar economy. The study also provides a clear picture of the intellectual property rights and the awareness needed in the area of copyrights and patent system of the country. It establishes the need for proper library orientation to use e-services and sources, preservation of the library materials, and skill development. Problems faced by the library professionals while providing e-services to the research scholars necessitates the need for training to the library professionals to acquaint with the latest technology in the field.
6.11 CONCLUSION

Engineering college libraries are the treasure trove of knowledge, catering to the needs of scholars, scientists, technocrats, researchers, students and others who are directly associated with the mainstream of higher education. The vision and mission of academic libraries are changing in India. These libraries now take on the key role of providing the competitive advantage to various research and development organisations which play a pivotal role in the process of nation building. In the modern library environment, the LIS professionals have to face different kinds of tough challenges. Technological application in a library institution will be fully successful only when there is a close co-ordination between the IT and the human resources. With growing needs and appreciation for the professionals whose hearts are dedicated to “taking care” of their fellow human beings, academic librarianship is and shall always be the jewel in the crown of higher education.

6.12 SUGGESTIONS AND RECOMMENDATIONS

6.12.1 From the Study

1. It is suggested that library committee should be organised in all engineering colleges.

2. All engineering college libraries should be fully computerised.

3. Library professionals should entrance the computer knowledge to handle the present information technology.

4. All library professionals must have e-mail Id.

5. Library professionals should improve the in knowledge of the emerging technology in internet.
6. Library professionals should have broad knowledge of various national level network.

7. Library professionals must have awareness in various book and digital material presentation.

6.12.2 General

- Different seminars, workshops, conferences regarding Information communication Development and Intellectual Property Rights and Copyrights, should be organised by different professional organisations and opportunities should be given for the professionals to participate in such seminars, workshops and symposium.

- The professionals should be encouraged to develop their professional skills by participating in advanced studies and research programmes.

- Provision should be made for the library personnel to interact with the different professionals and experts who are working in developed libraries.

- There must be improvement of overall infrastructure of the library.

- Timely orientation programmes is necessary for need to be organised for staff to cope with the dynamic changing scenario of library and information science.

- Training should be given to the staff for working on IT environment.

- Library professionals should take interest in getting training on IT application or any development.
Sufficient financial support from the management is a necessary for the overall library development.

Full automation is needed for all the library activities.

Regular Power supply should be provided.

Library users should be aware of the latest advancement.

Basic training in the handling of computer for accessing internet should be given to the library professionals.

6.6 FUTURE RESEARCH PERSPECTIVE

A study may be conducted in the area of Users’ Awareness of the Intellectual Property Rights and Copyrights System among Engineering College Libraries in the Southern Districts of Tamil Nadu.

A Study may be conducted in the area of Information Technology Challenges and Opportunities of Library Professionals in the Engineering College Libraries in the southern Districts of Tamil Nadu.

This study may be extended to the area of Challenges for Library Professionals in Information Communication Technology in Self-Financing Engineering Colleges in the Southern Districts of Tamil Nadu.