Chapter VI

SUMMARY, FINDINGS AND CONCLUSION

6.1 Summary:

Today we are living in the age of information. A large amount of information is being generated every moment. The ability to collect to store and disseminate large amount of information needs application of new technologies. Information is valid and necessary product of modern society. It grows from experience, observation inference, interaction and cultivation of knowledge. It is intended for socioeconomic development without which the present day human society cannot move its role is significant for the upliftment of education or education in the field of science and technology, commerce, industry or any field connected with the universe, proliferation of information, literature knowledge and tremendous literatures in the modern world.

Information and communication technology, usually called ICT, is often used as an extended synonym for information technology (IT) but is usually a more general term that stresses the role of unified communications and the integration of telecommunications (Telephone lines and wireless signals), intelligent building management systems and audio-visual systems in modern information technology. ICT consists of all technical means used to handle information and aid communication, including computer and network hardware, communication middleware as well as necessary software. In other words, ICT consists of IT as well as telephony, broadcast media, all types of audio and video processing and transmission and network based control and monitoring functions. The expression was first used in 1997 in a report by Dennis Stevenson to the UK
Government and promoted by the new National Curriculum documents for the UK in 2000.

ICT is often used in the context of "ICT Roadmap" to indicate the path that an organization will take their ICT needs. The term ICT is now also used to refer to the merging (Convergence) of audio-visual and telephone networks with computer networks through a single cabling or link system. There are large economic incentives (huge cost savings due to elimination of the telephone network) to merge the audio visual, building management and telephone network with the computer network system using a single unified system of cabling, signal distribution and management.

The concept of ICT in libraries is related with the development of work done by the machines and usage of computer in libraries. Historically and practically ICT is introduced in library as a library automation tool which is linked with human socio-cultural development and introduction of computer, its allied hardware/ software in the routine life. Library automation denotes an overall revolutionary change in libraries from collection management to delivery of services towards library users. Developed societies started library automation in the late 1960s and the developing world like India started library automation in late 1980s'. Libraries of developing countries are still struggling to bridge this 20 years gap and so is the case with India. Most of the developing countries of the world got their independence either from their rulers or from intruders. Many developing countries in Africa, South Asia and even some part of Europe were colonies of Great British Empire. Use of computer in the libraries revolutionized the environment of developing countries' libraries and also impacted their services. This change also touches the user by way of refining their usage and demands for qualitative services.
The researcher examined the use of information and communication technology in college libraries affiliated to Swami Ramanand Teerth Marathwada University, Nanded and Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Maharashtra) Marathwada Region. The present study covers data of 105 colleges including academic and aided professional colleges i.e. Academic (Arts, Commerce, Science) and Professional (B.Ed., Law & Engineering etc.). The thesis was organized into six chapters including Introduction, Review of Literature, Information and Communication Technology in Academic Libraries, Research Methodology, Descriptive Analysis and Interpretation of data and Summary, Findings & Conclusion followed by Bibliography.

The first chapter presents a brief introduction to the subject which selected for research study. It starts by defining the problem, then providing the research focus. Concepts are defined so that they do not remain general as they are meant to be specific to this research. The statement of the problem answers questions relating to the exact nature of the problem that the research is addressing. The purpose of the research or its justification is to study the ICT in Academic libraries affiliated to Swami Ramanand Teerth Marathwada University, Nanded and Dr.Babasaheb Ambedkar Marathwada University, Aurangabad.

Second chapter devoted to reviews of existing literature which helps clarify the nature of the problem and explains how the present research brings out to open the gaps or problems through an examination of literature by other researchers.

Third chapter focuses on ICT in Academic Libraries. This chapter includes Impact of ICT, role of Librarians and attitude towards the implementation in Academic libraries to provide the sources and services effectively and efficiently to the users.
Fourth chapter deals with the Research methodology including the research design of the thesis explaining research statement, aims and objectives, scope, research method, research questions and related hypotheses and also the statistical application used for data analysis.

Fifth chapter presents results of the findings regarding to the ICT in Academic libraries. This chapter deals with the descriptive analysis and interpretation of data related to general information, Infrastructural status, Library Automation, Document processing, E-Resources and services. Also discusses about the role and attitude of the librarians towards ICT in Academic Libraries.

Sixth chapter provides the presentation of the summary, findings, conclusions and suggestions arose from the research, as well as highlighting implications for further research followed by the bibliography and Appendices. APA style of format was used to cite the references of the authors in the bibliography.

6.2 Findings & Conclusion:

Infrastructural Status of College Libraries:

Response rate was 48.61 % from 105 academic libraries affiliated to Swami Ramanand Teerth Marathwada University, Nanded and Dr. Babasaheb Ambedkar Marathwada University, Aurangabad. The response rate from Nanded was 27.31% while 21.30% response rate was of Aurangabad university academic colleges.

It was found that 8.57% were established in the year 1950-1960, 11.43% were found established in the year 1961-1970, 10.48% colleges were established in the year 1971-80, 23.81% colleges were established in the year 1981-1990, 25.71% colleges found established in the year 1991-2000 and 21 colleges found established in the year 2001-2010. Mostly colleges found established in the year 1981-2000.

Further finding regarding to the working hours of colleges which are varies in the colleges. Morning 7 am to 5p.m in two shifts found in 9.52% colleges, 8
a.m. to 4p.m. found in 6.67% colleges, 9am. to 5p.m.found in 13.33% colleges, 10.00 am to 6.00p.m. time schedule was found in 70.48% colleges.

19% libraries provide open access, 31.50% libraries provide close access, 39% found mixed type i.e. the libraries provide open access to P.G. students, while close access to UG students.

Staff strength varies in academic colleges, It was found 1-5 number of staff available in 56.19% college libraries, 6-10 staff strength found in 19.05 colleges, 11-15 staff strength found in 3.81% colleges, 16-20 staff strength was in 5.71% colleges, 21-25 staff working in 4.76% colleges. Most of the colleges have. 1-5 employees in the library to work and manage all the library services.

It was also found 20.95% colleges have 1-100 sq. meter library space, 26.67% colleges have 100-200 sq. meter library space, 9.52% colleges have 200-300 sq. meter library space, 5.71% college library have 300-400 sq. meter space and 3.81% college library has 400-500 sq. meter space. 1.90% colleges have 600-700 sq. meter library space. There are five colleges out of 105 colleges each 0.95% college has 500-600, 700-800, 900-1000, 1100-1200, 1400-1500 sq. meter space for library respectively.

Next finding was that 80.0% colleges have adequate space to stack the collection while 12.4% colleges have no adequate space to stack the collection.

Further it was found that 67.6% colleges have standard Library furniture, 52.4% colleges have 1 to 50 seats available in reading room while 24.8% colleges have 51 to 100 Seating capacities in reading room and 7.6% colleges have 101 to 150 Seating capacity and 151 to 200 Seating capacity found available in 15.2% college library. 65.7% colleges found satisfied with their present physical facilities in library.
It was also found that security and disaster mitigation measures taken by 35.2% college libraries and 21.0% colleges are planning about their Security and disaster mitigation measures.

Computers are available in 83.81% college library It can be concluded that most of the libraries have computers in their libraries. 32.4% college libraries have CCTV security system for security purpose. 32.4% colleges have arranged CCTV in circulation section, 23.8% colleges have arranged CCTV in periodical section while 21.0% colleges have CCTV in reference section, 21.0% colleges have CCTV in reading room where in reception section area have arrangement of CCTV in 11.4% colleges. It can be concluded that CCTV is needed to monitor the sections and functioning of library. 3.9% colleges have Air Conditioned Library and 16.2% colleges have planned for Air Conditioned Library.

Regarding to the hardware, 60% college libraries have servers 75% colleges have printers available, scanners found in 43.9% colleges, Fax facility found in 13.4% colleges, UPS i.e backup system found in 65.8% colleges, Xerox machine found in 49.5% colleges, Barcode Reader found in 39.9% colleges, Barcode printer found in 29.5% colleges RFID technology not implemented in any college as the college has most of the text books to be issued and return and due to its huge cost.

**Software:**

Windows operating system used in 74.29% colleges while LINUX Operating system used by only 1 (0.95%) college, UNIX Operating system found not used in any college.

It was also found that college libraries using modules of library software, 60% found using Acquisition module, 49.5% use technical processing module, 42.9% serial control module, 61.9% using circulation module, 18.9% using WEB OPAC, 9.5% using Digital module, 40% using statistical module, It can be concluded that
most of the libraries use technical processing and circulation module for transaction in
the library. 63.8% colleges use Multi language support Unicode/GIST/ required for
entry of data in bilingual form.

**Networking:**

33.3% Colleges have wide campus for data communication This is
indication that most colleges were not provided wide campus for data communication
for users or student. 36.2% have applied LAN (Local Area Network) networking for
their library.

It was found that different types of bandwidth of internal networking used
by various colleges. 1mbps bandwidth network used by only 3.8% colleges, 8.6%
colleges have 1-10mbps and other 8.6% colleges have 10-50mbps bandwidth of
internal networking. Mostly that is 50-100mbps bandwidth network has been used by
45.7% colleges. Internet connectivity facility found in 63.80% college libraries,

21.9% colleges having 256 kbps Bandwidth internet activity, most of the
colleges have used bandwidth speed of internet 4mbps or more found in 29.5%
colleges. 6.7% colleges have 512kbps bandwidth speed of internet while 5.7%
colleges have 1-3mbps bandwidth speed. It can be concluded that college libraries not
providing high speed bandwidth, which requires to access the Internet and e-resources
in the library.

Most of the colleges use broadband, Leased Line used by 3.8% college
libraries and Radio-link used in only 1% college library. V-SAT and ISDN internet
connection not used in any college and WIFI facility found provided in 1.9% colleges.

BSNL Internet Service found in 60% colleges, Airtel internet service
found in 2.85% colleges, Reliance internet service found in 0.95% college. Regarding
the Internet nodes in the library, it was found that 1-5 computers having Internet
facility in 37.20% college libraries, 6-10 nodes available in 13.33% college libraries,
11-15 computers provided in 4.76% college libraries, 16-20 computers with Internet facility provided in 3.81% and 30, 37 computers found in only one 0.95% college library respectively. Most of the college libraries found providing more than 1 to 5 computers for Internet facility.

33.3% colleges have Separate browsing section for academic staff. Most of the colleges do not give separate browsing facility to the academic staff due to lack of computers available in the college libraries.

Further it was found that 26.66% college library users face Low band width problems, 8.57% colleges have high/ frequent Network down time, and 28.57% college libraries have insufficient nodes.

**ICT Solutions:**

21.0% colleges mention that their library created the bibliographic database and 64.8% college libraries not yet created bibliographic database, while 7.6% college libraries mentioned that they have planned to create bibliographic database in library.

It was found that web OPAC available in 18.1% colleges, while 59.4% colleges do not have Web OPAC and 4.8% colleges have planned for web OPAC. Local area Network facility for users found in 36.20% colleges, 18.1% college libraries provide facility of digital collection from its own resources, while 66.7% libraries do not have any digital collection and 6.7% college libraries mentioned that they have planned now to digitize the rare collection.

It was also found regarding to the digital collection from its own resources, 12.4% college libraries mentioned books, while 7.6% libraries mentioned from the collection of thesis/dissertation and 2.9% college libraries mentioned any other collection i.e. rare collection or manuscripts which are available in the library. Through Web resources 5.7% college libraries mentioned providing downloaded e-

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books, 4.8% mentioned that they provide facility through e-shodhsindhu through INFLIBNET and 4.8% college libraries mentioned any other collection i.e downloaded literature through web about planning to provide this service.

Regarding to the creation of digital collection, created it by in house by 12.39% colleges and Outsourcing by 5.71% colleges. The respondents expressed that they have scanner, digital camera but not upto the mark of high resolution technology devices to digitize the documents, in such cases the college libraries has to outsource the documents i.e. rare books or thesis collection etc

It was found that 5.7% colleges mentioned use of High end scanners for developing digital Library and 12.4% colleges mentioned that they have planned to use high end scanners for developing digital library required for digitization of collection.

It was also found that 83.80% colleges have IT trained staff in their library 10.47% colleges manage through computer centre, while 3.8% manage private and manage on Ad-hoc basis in 1.9% colleges.

80% respondents agreed to the statement that library software provides the framework that integrates the institutions broader technical infrastructure, 82.9% respondents mentioned that they have common web platform for acquiring describing, managing, sharing and delivering information.

81.9% respondents mentioned that they accept the statement regarding to the collaborative and consortia activity increasingly becoming important or reposition libraries into next generation.

87.6% college libraries use DDC schedule, UDC found used in only one college and Colon classification found used in 2.3% college libraries. AACR2 used in 84.76% colleges, classified catalogue code found used in 1.90% colleges.
It was found that 32.4% college libraries use Sears as a tool for subject heading, LCSH used in 36.1% college libraries, chain indexing used in one college, the librarian manage due to wide experience of library management

51.3% college libraries follow manual processing, automated processing followed by 39.1% college libraries. It was found that CCF i.e common communication format used in 4.8% college libraries to prepare bibliographies, MARC used in 38.1% colleges, XML used in only one college and 56.2% respondents gave no response.

21.91% college libraries recorded 1-25 documents processed in a day, 26-50 documents found processed in 49.57% college libraries, 51-75 and 75-100 documents processed daily in 1.91% colleges and 150 and more than 150 documents processed recorded in 1 college library respectively while 23.8% colleges gave no response to this question. Documents processing depends on the man power and attitude of working in libraries. It can be concluded that mostly documents processing ranges from 26 to 50 in college libraries. Regarding to the technical processing, library professionals expressed that they have lack of trained staff, lengthy procedure of processing and time consuming. The books purchased in bulk quantity and needs time to process for circulation.

Regarding to the manpower utilization for value added services, 20% respondents expressed that most of the time is utilized in housekeeping job, while 65.7% respondents expressed that it is possible to handle housekeeping job as there is not much activity regarding to the value added services, 1.9% found unaware about value added services.

It was found that 23.52% college libraries accepted to subscribe global consortia as alternative solution, 58.9% utilize the national consortia, 11.76% outsource from private sectors and 5.9% found membership of DELNET.
Regarding to the databases the library professionals expressed that INFLIBNET/INDEST databases provide vast collection rather than subscription, and also supports to access it user friendly.

**Library Automation:**

It was found that only 71.42% respondents automated their college libraries, 60% respondents has purchased library automation software in the college libraries, as revealed in the analysis the library automation software developed In-house and also used Open Source software to automate the library. Regarding to the selection of Library software, the library professionals opined the library software supports multilingual, easy to handle, user friendly, provided by INFLIBNET and contains all library automation modules.

It was found that mostly respondent has planned i.e 28.6%, 21% started, fully automated mentioned by 29.5% and partially mentioned by 22(21%).It can be concluded that the stages of library automation varies in the libraries.

60.9% respondents mentioned that the college libraries have separate server to run the library software. It was also found that one year duration for automating library mentioned by 16.19% respondents, colleges less than one year mentioned by 14.29% colleges, Two years duration for library automation mentioned by 11.43% college libraries, Four year duration and five year duration mentioned by 7.62% colleges and 2.86% colleges respectively for making library automation.

It was found that the Automation process was completed with the help of Staff in 29.52% colleges and outsourcing of library automation was performed in 17.14% colleges and mentioned both were 9.52% college libraries ie the staff and some part was outsourced wherever necessary. It can be concluded that manpower is the main problem in the libraries, due to lack of manpower and skillful staff, libraries has to outsource the job work of the libraries.
Retrospective conversion process through accession registers 42.66% followed by direct from book was mentioned by 52% respondents respectively. Only 5.34% mentioned retrospective conversion through automatic import data. It can be concluded that the libraries has updated their accession register to enter the data in the cataloguing modules and some libraries prefer data direct from the book.

**Use of ICT in Collection Development:**

Regarding to the ICT in Collection development, 45.7% thought that ICT affect the collection development. 39% feel ICT affects the regular budgeting provision, while 47.6% respondents do not feel that ICT affects the regular budgeting provision and takes positively. Most of the libraries prefer manual system in budgeting provision as there is no consistency in work, so they manage manually. 43.8% librarians expressed that operational costs are exceeding year by year, while 41% do not feel. 38.1% mentions yes for annual maintain cost of ICT products that affects collection development; while 41.9% do not feel about maintain cost. It can be concluded that most of the respondents feel ICT leads to balanced collection development.

It was found that ICT based services provided by the libraries were OPAC by 55.3% college libraries. Web OPAC mentioned yes by 18.09%, providing DVD mentioned yes by 37.1% respondents, Libraries website designed and published by 4.76% respondents, VCD facility is available in 27.6% college libraries, List of new arrivals mentioned yes by 45.7% respondents, providing E–Book facility in 41% college libraries, E-Journal online service provided by 50.5%, and the special service to the research scholars i.e. SDI mentioned by 22.9% respondents. Use Net/ News Group mentioned yes by 17.1%, E-Query mentioned Yes by 15.2%, Email service mentioned yes by 55.3%, Bibliographic Database mentioned yes by 39%, regarding to Full Text Databases mentioned yes by 37.1%, use of Smart Card technology
mentioned yes by only 1%, CD Net Server mentioned yes by 10.5%, Internet Service mentioned yes by 63.80%, and regarding to CD–ROM Database mentioned yes by 29.5%. It can be concluded that most of the college libraries providing ICT based services to the users.

**Types of E–Resources :**

Further it was found that e-resources mostly found provided online database to users in 36.2% colleges. Then response of printer in e-resources section provided in 31.4% college libraries, Separate section for e-Resources found in 25.7% college libraries. And lastly provision for separate budget for e–Resources mentioned yes by 19.1% respondent college libraries.

Next finding was regarding to the number of systems available for use of e-resources in college libraries. 1-5 number of systems found in 14.29% college libraries, 6-10 system found for e-resources available in 4.76% college libraries, 11-15 computer systems for e-resources handling found available in 2.86% colleges and 16-20 and more than 20 computer systems found in 1.90% colleges respectively.

Further it was found that regarding to the hindrance of access electronic resources, 32.4% mentioned too much information retrieved by the users, 20% said it is time consuming, 38.1% said limited access to computer terminal, 21% mentioned lack of IT knowledge to utilize the services and 10.5% said using electronic resources often detracts from doing work. It can be concluded that access to e-resources creates hindrances to the library professionals when they face lack of nodes in the colleges, compatible terminals, and lack of knowledge to provide skilful services to users and also have to maintain the documentation of utilization.

**Status of UGC–INFONET Programme:**

It was found that 11.4% colleges are member of UGC INFONET Program mentioned yes, and some colleges mentioned access through the university library.
The library professionals expressed that they access UGC-INFONET through University membership or even the university provides facility to use the database on individual basis on charges especially in Aurangabad University. It can be concluded that only 12 colleges access e-resources through INFLIBNET, which is less in number. Bibliographical database found in 27 college libraries, e-books were mentioned by 50 college libraries.

**Connectivity & Usage of National/ International Consortia:**

The connectivity and usage of national and international consortia found in 29.52% colleges, only 29.52% colleges found member of library consortia for e-Resources other than UGC–INFONET.

**E–Resources:**

The college libraries have the collection including CD-ROM, e-database, e-journals and e-books. CD-ROM titles purchased mostly in the year 2011-12, e-database subscribed in maximum colleges in the year 2009-10, e-journals subscribed found highly in maximum colleges i.e. 16.19%. E-reports, e-content pages found nowhere, e-Clippings found in the year 2010-11, 2011-12 and only in one college. E-books found in the year 2007-2008 in maximum colleges i.e. 14.28%. It can be concluded that the subscription of e-resources found in the year 2007-08 as the colleges received 11th plan UGC grants, after that the subscription found less.

The mode of e-resources that provide the e-resources’ through the Internet via their website mentioned yes by 35.2%, CD-ROM network mentioned yes by 9.5%, Commercial Online service vendors for providing e-resources mentioned by 4.8% respondents, Others i.e e-resources access through university library mentioned yes by 2.9%. Mostly e-resources subscribe full text in 47.7% college libraries. The e-resources subscribe in abstract form in 31.4% college libraries, 25.7% college libraries subscribe bibliographic database. It can be found that numerical databases ie.
Providing statistical information and graphic databases found less in college libraries as it has no demand in the college libraries.

Next finding was regarding to the question of criteria for selecting of e-resources, 64.8% mentioned that they try to meet user need, Subject relevance was mentioned by 66.7% respondents, Cost effectiveness criteria was used by 64.8% college librarians, Authentic Information said by 53.3%, 15.2% respondents mentioned that they prefer after sale maintenance, CURRENCY OF INFORMATION was also rated yes by 49.2%. Back Issues facility is also important mentioned by 52.4%, Distributed Access was rated 36.2%, Period of Access is also important criteria mentioned by 32.4%, next criteria Added Value was mentioned by 31.4%, Ease of accessibility by 46.70%, Legal Issues mentioned by 25.7%, Preservation mentioned by 24.8%, Vendor reliability said by 30.5% and Period of Access mentioned by 19% respondents. It can be concluded that more or less users need subject relevance, currency, back issues facility rated high, added value period of access ease of availability rated moderate but all the criteria are very important to refer for the selection of e-resources.

**Users of E-Resources:**

Regarding to the timing of the section to be kept open for accessing e-resources, 51.4% college libraries found keeping e-resources section open for 6-8 hours, 8-10 hours section is open in 13.3% colleges, only one college found open above 10 hours.

Further it was found that 43.80% college libraries provide the printing facility to the users, 44.78% college libraries charges cost to use the e-resources for users.

Regarding the printing charges per paper were found that 28.26% college libraries provides free of cost, 2.17% college provide only for library work, 23.91%
charges 50 paise per page, 1 rupee charged by 43.5% and 2 Rupee charged by only one college library. 13.30% respondents mentioned yes for the charges for using resources.

The charges vary from faculty members, research scholars, PG students, UG students and Administrative staff. Only one college charge 500/- per month to the faculty members and 200/- charged by one college to faculty members and research scholars and one college charges 100 rupees for faculty and research scholar while two colleges charge 100 rupees to PG, UG students to access the Internet facility per month. While 10/-, 15/- and 20/- Rs charged by other colleges to the users.

Regarding to the collection development policies, 10.5% colleges found making policy decisions involved in purchasing activities, 33.3% mentioned that Policy should be open to changes & constantly involved & update so that it does not affect collection development policies.

Out of one hundred and five college libraries, seven college libraries mentioned that they catalogue e-resources, seven colleges have subscribed e-resources and maintained CD-ROMs, 57.14% college libraries have free online e-resources and only one college library mentioned that they download free online e-resources which can be served to the users according to their demand.

It was also found that only 4.8% college libraries have their own library website, while other colleges i.e. 87.7% have the link of library.

Regarding to the preservation of e-resources, 13.3% college libraries preserve e-resources, 85.71% college libraries using different formats to store the e-resources i.e PDF format files, and also 14.29% college libraries is using CD’s to store the data.

Out of 15 college libraries, almost all colleges have licensing agreements, 80% college libraries mentioned that due to Licensing agreements authorized users
will use the resources, 46.67% said cost of access, 60% mentioned can access, archival backup and can keep confidentiality. 33.33% college libraries use multiple format and negotiations with the software providers, 46.67% colleges use electronic links, 33.33% colleges mentioned Inter Library Loan, 40% colleges mentioned protection of increase of price, 33.33% college libraries mentioned dispute resolution, 46.67% mentioned that they can download records for in-house database and 26.67% others i.e. archive literature from the databases.

Regarding to the weeding policy of e-resources, 18.1% college libraries mentioned longer availability of e-resources, 16.2% also mentioned that they find difficult to maintain the e-resources, 11.4% mentioned more comprehensive coverage, 13.3% mentioned that they take the users opinion to evaluate the subscribed e-resources to take the decision either to continue or to cancel the subscription to these resources and only one college library mentioned that Library continue to flew weeding out of the e-resources. It can be concluded that maintenance of e-resources in the library and weeding out policy is very difficult to follow and maintain the consistency in subscribing e-resources every year.

Next finding regarding to the problems encountered while using the e-resources found that 35.2% mentioned slow access speed, 22.9% said it is difficult to find relevant information, 32.4% said there is overload of information on the Internet, 30.5% expressed that it takes too long to view/download pages and 2.8% respondents said that they need training about the handling of e-resources so that they can provide the services regarding to the e-resources effectively to the users. It can be concluded that speedy internet connection needed to view the e-resources without any interruption in the access of files.
**Comparison of conventional documents and E-Resources:**

According to the opinions of the respondents, it was found that 81.9% college libraries mentioned using e-resources is time saving while 3.8% mentioned time consuming, 76.2% said more informative while 2.9% said less informative, 15.2% said more expensive while 56.2% mentioned less expensive, 63.8% respondents mentioned easy to use while 8.6% said complicated, 55.2% mentioned more preferred while 19.1% said less preferred, 56.2% said more flexible while 14.3% expressed less flexible, 67.7% said easy to handle while 7.60% expressed complicated and 56.2% said more effective while 15.30% mentioned less effective.

It can be concluded that comparatively the respondents opined that e-resources are more useful than conventional documents and also less expensive to offer the services to use the e-resources in the libraries.

**Information Resources:**

Regarding to the access to e-resources, 47.6% college libraries provide access to e-resources, 40% college libraries do not have this facility, and planned for future mentioned by 6.70% college libraries.

It can be concluded that 50% college libraries provide access to e-resources while other libraries have many problems to provide access to e-resources.

47.62% college libraries provide access to e-books, 48.57% college libraries provide access to e-journals, 14.29% mentioned college libraries providing access to e-theses and 8.57% mentioned about the database, through Internet online journals, access to INFLIBNET databases etc. It can be concluded that only fifty percent college libraries actively provide access to the e-resources including e-books, e-journals, e-theses etc. through subscribed or through open access material. Only 7.62% college libraries subscribed e-resources from the university, 20.95% mentioned
that they access through Consortia from INFLIBNET/INDEST and one i.e 0.95% mentioned from public domain resources i.e open source resources.

It was also found that 7.7% colleges provide access to e-resources through campus IP authentication, 16.2% provide through user Id and password, 8.6% provide only in library and only one college mention that they provide through their web portal. It was also found that 11.4% respondents mentioned yes for providing web based services, 8.6% mentioned will plan.

Further it was found that 11.4% mentioned yes to the service “Ask Librarian Services”, 10.5% mentioned yes to the service “Virtual references service”, 7.61% mentioned yes to the service “Service through Web Portal”, 1.90% mentioned yes to the service “Knowledge Base Management”, 7.6% mentioned yes to the service “Web Technologies and services through library interface”.

It was also found that the respondents expressed views regarding to next generation value added library services, yes was mentioned by 25.7%, 2.9% cannot express their views. It can be said that very few college respondents are of opinion of the next generation value added library services can only safeguard the future of academic libraries.

**Collaborative Model:**

It was found that 14.30% respondents mentioned yes for collaboration services. It was also found that 49.5% college libraries believe in collaboration with other sector libraries, 15.2% expressed that there are no such benefits. There are many advantages to have network of libraries to share the resources and expertise for the new developments in the libraries.

It was found that 10.5% respondents mentioned collaboration with special libraries, 1.9% mentioned with public libraries, 40% found rated to college libraries, 1% only mentioned corporate libraries, 17.1% mentioned Government libraries and 27.6%
mentioned they access university libraries for their users. It can be concluded that collaboration with libraries is highly needed and most of the libraries found collaborating with the libraries for the resources, services and to access these resources from mostly university libraries.

Regarding to the mode of resource building, standalone mode was mentioned by 9.5% respondents, collaborative mode was mentioned by 3.8% respondents, and response rate to both option was given by 6.6%. It can be concluded that this concept of mode for resource building is not so much famous in academic libraries as the users do not demand for the resources for research purpose. The faculty members seek resources from university libraries or special libraries for their updating or research purpose.

It was found that the role played by the libraries in the collaborative mode, 2.9% mentioned that they establish linkages with other libraries and also participate in consortium respectively, 2% respondent mentioned that they seek consortium membership and only one percent provide the referral services to the users referring them to the consortium related to their subject interest.

Further it was found regarding to the functions of libraries participating in collaborative activity, very few college libraries participate in this activity, 7.6% mentioned collaborative acquisition, 13.3% mentioned acquiring e-books, 14.3% mentioned Acquiring of E-Journals, 2.9% mentioned collaborative technical processing, 2.9% mentioned collaborative referencing, 4.8% mentioned collaborative document delivery service, 7.7% organize Joint training programmes for staff and only one mentioned that seek help from the experts from the other college libraries.

7.7% college libraries participate in centralized data processing on local computer, 1.9% mentioned Centralized Data Processing on external server and only one percent mentioned distributed data processing on external server. In college
libraries it is very difficult task to maintain the separate server for the collaborative activity due to budget constraints and also the management is reluctant to provide the facilities to the college libraries, only private institutions are well equipped with facilities and infrastructure.

Next finding was regarding to the managing of servers at consortium level for centralized data processing as it needs skillful manpower. It was observed that only 4.9% college libraries mentioned that they appointed consortium manager, 5.7% college libraries mentioned joint responsibility of member libraries. It can be concluded that consortium activity is not popular in the colleges. Few college libraries participate in centralized processing of consortium.

It was also found that 11.4% colleges share e-books, 14.3% share e-journals, 7.6% share e-theses, 5.7% help the libraries put digital collections online, 3.8% respondents mentioned that they provide tools for managing digital resources, 2.9% respondents mentioned that they managing resources as well as share human resources for generate digital library services.

It can be concluded that these few libraries promote each other to provide library services at consortium level. They have signed agreement to provide digital library services among each other.

Regarding to the consortia 8.6% college libraries provide access to the users through university library as UGC-INFONET is provided to the colleges and one college mentioned that they use other consortia which are developed in-house or subscribed.

**Barriers in Implementation of Library Automation:**

There are many barriers regarding to the library automation, library professionals face many barriers 70.5% mentioned facing financial problem, 38.1% face overload of work, 50.5% face due to lack of knowledge, 14.3% face due to Lack
of Interest in learning IT and Higher authority is not interested to send library staff to upgrade their IT skills respectively, 13.3% due to Lack of in-service financial/promotional reward as it is also necessary to work with devotion and contribution, 56.2% mentioned lack of sufficient staff in the library, 24.8% says lack of IT training facility, 7.6% says due to lack of staff coordination creates problems, 15.2% mentions lack of space and 25.7% college libraries mentions lack of adequate staff training for work to be done in the libraries.

It can be concluded that college libraries face many problems due to lack of knowledge, manpower, and infrastructure, lack of space and adequate staff which requires providing services to the users effectively and efficiently.

Next finding was regarding to the library professionals about the mode of acquiring IT skills by the staff, it was found that 25.7% college libraries grasp through formal education, 16.2% mentioned informal education, 19% mention through colleague, 68.6% mentioned self study as they believe in developing themselves and cope up with the technology, 32.5% take training at work place, 60% mentioned they Attend Workshop / Seminar, 11.4% take from outside if sponsored, 6.7% library professionals mentioned outside computer training without sponsor and 26.7% mentioned that they take Training from software supplier.

Regarding to the Librarians attitude towards the use of ICT, 84.8% agree and 6.7% strongly agree to the statement "Use of ICT facilitate quick access to current data", 73.3% respondents agree and 13.3% strongly agree to the statement “Implementation of ICT reduce work load of library professional” and ‘Use of ICT in library increase job satisfaction”, 80% respondents agree and 12.4% strongly agree to the statement “Utilization of ICT help to improve communication”, 70.5% and 21% respondents mentioned agree and strongly agree respectively to the statement Application of ICT improve quality of library or librarian and 78.1% agree with the
statement “ICT implementation helps to enhance knowledge and skills of library professional, 72.4% agree to the statement “Use of ICT makes an integration in library and 56.2% agree to the statement “ICT affects disturb library routine work. It can be concluded that Librarians attitude towards ICT is positive, but there are so many constraints regarding manpower, lack of knowledge and skills, lack of budget provision, though their attitude is positive, but unable to develop the libraries.

It was found that concerned to librarians attitude towards cost and resource allocation for ICT more than 63% respondents disagree with the statement ICT is luxury for college libraries. 51.4% respondent agree to the statement and 18.1% strongly agree with the statement “ICT maintain expenditure is very high” .79% respondents agree with the statement “cost is the major factor for not buying technological tools”. 65.7% agree and 21.9% strongly agree to the statement “Extra fund allocation should be spent on ICT”.48.6% agree and 21% strongly agree with the statement “each year library should increase ICT expenditure” and 70.5% agree while 19% strongly agree with the statement “Training fund allocation is must for ICT”.

It was also found that regarding to the problems in implementation of ICT sources and services, 40% disagree with the statement lack of support from administration in training library professional, while 28.6% and 3.8% agree and strongly agree to this statement. Lack of fund mentioned by 60% respondents, 59% agree to the statement “Lack of It trained staff”, 42.9% disagree to the statement, while 24.8% and 8.6% agree and strongly agree to the statement “lack of planning and support from higher authorities to implementation of ICT in Library” 25.7% disagree to the statement “Lack of ICT infrastructure”, 63.8% agree for the consultancy services are lacking for ICT, 53.3% disagree to the statement about the more time for retro-conversion and bar-coding, 64.8% agree for lack of awareness and hesitation, 38.1% and 6.7% agree and strongly agree for lack of motivation, while 50.5% disagree for lack of motivation, 59% respondents mentioned that they disagree about the fear of ICT application, 68.6% respondents mentioned inadequate training in ICT application and 62.9% respondents disagree with the statement Lack of coordination among library staff. It can be concluded that there are so many problems in
implementation of ICT sources and services 50% libraries agree with lack of funds, infrastructure, awareness, inadequate training. But above 50% respondents mentioned that there is coordination among the staff for the work to be done in the libraries.

It was also found regarding to the Librarians attitude towards impact of ICT, most of the respondents disagreed i.e 84% with the statement “Extensive use of ICT has created job fears amongst libraries, 79% and 17.1% agree and strongly agree with the statement “ICT help provides specific information available”, 64.8% and 16.2% mentioned agree and strongly agree about the statement “Data retrieved through print resources is authentic”, “Information retrieval is easy through printed resources” mentioned equally 50% agree and disagree as the respondents may be equally familiar to print and e-resources. Most of the respondents i.e 64.8% mentioned agree, 31.4% mentioned strongly agree and only 3.8% disagree with the statement “ICT offers more efficient ways to carry library operations”, followed by next finding that 99% respondents agree and strongly agree to the statement “ICT enables most effective ways of resources sharing of e-resources”. Maximum respondents that is 69.5% and 29.5% agree and strongly agree respectively with the statement “Online database provide more up to date information” Next statement “Changes due to application of ICT are out of control for the librarians” mentioned strongly disagree by the respondents i.e. 82.9% as they mentioned that due to ICT, it has become easy to monitor and handle the library effectively. And last statement was “computer creates health and an environment problem, which was found, disagrees by 84% respondents.

It was found regarding to the barriers in use of ICT in college libraries, 18.1% said that they experience resistant of library staff to cope up technology, 39.1% mentioned very difficult to Keep abreast of new developments/trends, 43.9% finds lack of user education programme, 22% mentions misuse of ICT equipment for non-official purpose, 24.8% finds lack of network facility, 36.2% finds difficult work done in library due to Inadequate trained staff in IT application, 68.6% mentions lack of funds and 15.2% mentioned lack of support from management/ higher authorities.

It can be concluded that various barriers faced by the library professionals while handling the library. The library professionals need support from the management authorities to develop the library regarding to adequate space, infrastructure but also must be the devotion of the staff to adopt new technologies to develop the library in the era of Information and communication technology.
The status of the library automation and infrastructural development of college libraries in Aurangabad and Nanded University is lacking behind as the libraries need proper ICT infrastructure including hardware, software and skilled manpower to provide the services effectively and efficiently. In the digital era, every library has to go through ICT as it is the need of the hour. The academic libraries have to work hand in hand with the computer experts to develop and uplift the library. The management should have the written policies about the development and implementation of ICT and access to e-resources in the academic libraries to the users. The follow-up and the initiative of the library professional is very much needed to develop the library with infrastructure, implementation of Library automation, Purchase of E-Resources and online services to the users of the college libraries. The calculated of $X^2$ is much higher than table value, the null hypothesis is rejected. It can be concluded that though the Librarians have positive attitude towards the ICT in academic libraries, they accept the challenges but there is need of support and backing of the management to implement and make use of ICT in academic libraries.

6.3 Summary of the Null Hypotheses test:

The study was carried out with following research questions and null hypotheses:

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Research Questions/Null Hypothesis</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What are the librarians' attitudes towards the use of ICT?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>There is no significant difference about the “use of ICT facilitate quick access to current data” and librarians attitudes towards the use of ICT.</td>
<td>Rejected</td>
</tr>
<tr>
<td>2</td>
<td>There is no significant difference about the “Implementation of ICT reduce work load of library professional” and librarians’ attitude towards the use of ICT.</td>
<td>Rejected</td>
</tr>
<tr>
<td>3</td>
<td>There is no significant difference about “Use of ICT in library increase job satisfaction” and librarians attitudes towards the use of ICT.</td>
<td>Rejected</td>
</tr>
<tr>
<td>4</td>
<td>There is no significant difference about the “Utilization of ICT help to improve communication” and librarians attitudes towards the use of ICT.</td>
<td>Rejected</td>
</tr>
<tr>
<td>S.N.</td>
<td>Research Questions/Null Hypothesis</td>
<td>Results</td>
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</tr>
<tr>
<td>5</td>
<td>There is no significant difference about the “Application of ICT improve quality of library services” and librarians attitudes towards the use of ICT.</td>
<td>Rejected</td>
</tr>
<tr>
<td>6</td>
<td>There is no significant difference about the “Use of ICT improve status of library/ librarian” and librarians attitudes towards the use of ICT.</td>
<td>Rejected</td>
</tr>
<tr>
<td>7</td>
<td>There is no significant difference about the “ICT implementation helps to enhance knowledge and skills of library professional” and librarians attitudes towards the use of ICT.</td>
<td>Rejected</td>
</tr>
<tr>
<td>8</td>
<td>There is no significant difference about the “Use of ICT makes an integration in library” and librarians attitudes towards the use of ICT.</td>
<td>Rejected</td>
</tr>
<tr>
<td>9</td>
<td>There is no significant difference about the “ICT affects disturb library routine work” and librarians attitudes towards the use of ICT.</td>
<td>Rejected</td>
</tr>
<tr>
<td></td>
<td><strong>2. What are the Problems in implementation of ICT source and services?</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>There is no significant difference about the “Lack of support from administration in training library professional” and Problems in implementation of ICT source and services.</td>
<td>Rejected</td>
</tr>
<tr>
<td>2</td>
<td>There is no significant difference about the “Lack of fund” and Problems in implementation of ICT source and services.</td>
<td>Rejected</td>
</tr>
<tr>
<td>3</td>
<td>There is no significant difference about the “Lack of IT trained staff” and Problems in implementation of ICT source and services.</td>
<td>Rejected</td>
</tr>
<tr>
<td>4</td>
<td>There is no significant difference about the “Lack of planning and support from higher authorities to implementation of ICT in library” and Problems in implementation of ICT source and services.</td>
<td>Rejected</td>
</tr>
<tr>
<td>5</td>
<td>There is no significant difference about the “Lack of willingness of staff” and Problems in implementation of ICT source and services.</td>
<td>Rejected</td>
</tr>
<tr>
<td>6</td>
<td>There is no significant difference about the “Lack of ICT infrastructure” and Problems in implementation of ICT source and services.</td>
<td>Rejected</td>
</tr>
<tr>
<td>7</td>
<td>There is no significant difference about the “Lack of consultancy services for ICT” and Problems in implementation of ICT source and services.</td>
<td>Rejected</td>
</tr>
<tr>
<td>8</td>
<td>There is no significant difference about the “Taken more time for retro-conversion &amp; bar-coding” and Problems in implementation of ICT source and services.</td>
<td>Rejected</td>
</tr>
<tr>
<td>S.N.</td>
<td>Research Questions/Null Hypothesis</td>
<td>Results</td>
</tr>
<tr>
<td>------</td>
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</tr>
<tr>
<td>9</td>
<td>There is no significant difference about the “Lack of awareness/ hesitation” and Problems in implementation of ICT source and services.</td>
<td>Rejected</td>
</tr>
<tr>
<td>10</td>
<td>There is no significant difference about the “Lack of motivation” and Problems in implementation of ICT source and services.</td>
<td>Rejected</td>
</tr>
<tr>
<td>11</td>
<td>There is no significant difference about the “Fear of ICT application” and Problems in implementation of ICT source and services.</td>
<td>Rejected</td>
</tr>
<tr>
<td>12</td>
<td>There is no significant difference about the “Inadequate training in ICT application” and Problems in implementation of ICT source and services.</td>
<td>Rejected</td>
</tr>
<tr>
<td>13</td>
<td>There is no significant difference about the “Lack of coordination among library staff” and Problems in implementation of ICT source and services.</td>
<td>Rejected</td>
</tr>
</tbody>
</table>

3. **What are the Librarians attitudes towards cost and resource allocation for ICT?**

<table>
<thead>
<tr>
<th></th>
<th>Research Questions/Null Hypothesis</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>There is no significant difference about the “ICT is still a luxury for college libraries” and Librarians attitudes towards cost and resource allocation for ICT</td>
<td>Rejected</td>
</tr>
<tr>
<td>2</td>
<td>There is no significant difference about the “ICT maintain expenditure is very high” and Librarians attitudes towards cost and resource allocation for ICT.</td>
<td>Rejected</td>
</tr>
<tr>
<td>3</td>
<td>There is no significant difference about the “Cost is major factor for not buying ICT for libraries” and Librarians attitudes towards cost and resource allocation for ICT</td>
<td>Rejected</td>
</tr>
<tr>
<td>4</td>
<td>There is no significant difference about the “Extra funds allocations should be spent on ICT” and Librarians attitudes towards cost and resource allocation for ICT.</td>
<td>Rejected</td>
</tr>
<tr>
<td>5</td>
<td>There is no significant difference about the “Each year libraries should increase ICT expenditure” and Librarians attitudes towards cost and resource allocation for ICT.</td>
<td>Rejected</td>
</tr>
<tr>
<td>6</td>
<td>There is no significant difference about the “Training fund allocation is must for ICT” and Librarians attitudes towards cost and resource allocation for ICT.</td>
<td>Rejected</td>
</tr>
</tbody>
</table>

4. **What are the Librarians attitudes towards impact of ICT?**

<table>
<thead>
<tr>
<th></th>
<th>Research Questions/Null Hypothesis</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>There is no significant difference about the “Extensive use of ICT has created job fears amongst libraries” and Librarians attitudes towards impact of ICT</td>
<td>Rejected</td>
</tr>
<tr>
<td>2</td>
<td>There is no significant difference about the “ICT helps provide specific information available” and Librarians attitudes towards impact of ICT</td>
<td>Rejected</td>
</tr>
<tr>
<td>S.N.</td>
<td>Research Questions/Null Hypothesis</td>
<td>Results</td>
</tr>
<tr>
<td>------</td>
<td>--------------------------------------------------------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>3</td>
<td>There is no significant difference about the “Data retrieved through print resources is authentic” and Librarians attitudes towards impact of ICT</td>
<td>Rejected</td>
</tr>
<tr>
<td>4</td>
<td>There is no significant difference about the “Information retrieval is easy through printed resources” and Librarians attitudes towards impact of ICT.</td>
<td>Rejected</td>
</tr>
<tr>
<td>5</td>
<td>There is no significant difference about the “ICT offers more efficient ways to carry library operations” and Librarians attitudes towards impact of ICT.</td>
<td>Rejected</td>
</tr>
<tr>
<td>6</td>
<td>There is no significant difference about the “Online databases provide more up to date information” and Librarians attitudes towards impact of ICT.</td>
<td>Rejected</td>
</tr>
<tr>
<td>7</td>
<td>There is no significant difference about the “ICT enables most effective ways of resources sharing” and Librarians attitudes towards impact of ICT.</td>
<td>Rejected</td>
</tr>
<tr>
<td>8</td>
<td>There is no significant difference about the “Changes due to application of ICT are out of control for librarians” and Librarians attitudes towards impact of ICT.</td>
<td>Rejected</td>
</tr>
<tr>
<td>9</td>
<td>There is no significant difference about the “Computer creates health and environmental problems” and Librarians attitudes towards impact of ICT</td>
<td>Rejected</td>
</tr>
</tbody>
</table>

### 6.4 Suggestions:

The suggestions to the library professional and the administration committee, who looks after the development of the libraries, were as following:

- The management should provide free flow of funds to automate and networking of libraries
- The management should take the decisions and promote the libraries to cope up the new technologies and implement in the libraries.
- There should be no budget constraints
- Authority should give the independence to the librarian to take the decisions for the betterment of libraries.
- ICT tools and infrastructure should be developed in the libraries.
- Libraries are not fully automated; fully automated modules should be used for providing online library services.
Information and Communication Technology should be up to the mark in the libraries

Online and offline Library services should be provided to the users.

Setup of Digital Library and Knowledge Resource centre to provide online e-resources services to the users is needed.

Librarians’ attitude towards the Information and Communication Technology should be positive so that the implementation will be possible in effective way.

6.5 Area for Further Research:

The scope of the research in Information and Communication Technology can be extended as following:

- Use of Information and Communication Technology in University Libraries of Maharashtra state.

- Comparative study of Use of Information and Communication Technology in University Libraries of Maharashtra and Madhya Pradesh state.

- Use of Information and Communication Technology in University Libraries of India.