Libraries are implementing technologies for networking, faster delivery and easy exchange of information sources and services. This is changing the whole scenario of libraries in terms of infrastructure, electronic information environment and ways of operating library services. ICT skills are considered necessary for staff and users to handle technological changes.

5.1 TESTING OF HYPOTHESES

HYPOTHESIS 1

Librarians do not consider any Change Management Model while planning and implementing technological changes.

Librarians were asked in the questionnaire whether they consider any strategies and existing Change Management Model for effectively managing technological change. Majority of the librarians from all the agricultural institutions admit that they plan well in advance for managing change but majority of them are not considering any change management models for implementing change process. Moreover majority of them are not even aware about the existing models of change management. Staff’s views and interests are considered and regular meetings held to a great extent by majority of the librarian while implementing change process, but most of them do not conduct SWOT analysis before initiating change process. Moreover no definite deadlines are set before staff to complete change process in time. Hence training is also essential for librarians especially in the area of change management and various existing models for managing change. It will help them in planning and implementing change process more efficiently and managing change effectively well in time.

HYPOTHESIS 2

Technology comfort among staff is necessary to decline resistance and maximize participation.

Correlation was performed between Technology comfort vs. Participation, Favor change and Change resistance to study the impact of technology comfort on resistance. A positive relation was found between all the variables. Therefore it can be concluded that with the increase in technology comfort, staff’s participation and favors to change also increases which automatically declines the resistance. Hence measure should be taken to develop staff’s technical competence by enhancing their ICT skills. Moreover most of the librarians have admitted that
they enhance the ICT skill of staff to overcome resistance and to motivate staff to participate in change process.

**HYPOHESIS 3**

The technological changes are perceived by most of the library staff in a positive manner as they understand that it is necessary to succeed and grow.

All the members of library staff were asked in the questionnaire whether they favor technological change in their respective libraries. Majority of the staff reported that they favor technological changes as they consider it necessary for the future growth of libraries and to serve the future generation. Hence motivating staff towards technological change is not a difficult task for library managers as their attitude towards change is already positive.

**HYPOTHESIS 4**

Internet facility and user education are the most preferred services by the users.

The users were asked to rate the services, they prefer in order of priority in this ICT era. Users prefer internet facility and user education at the top in order of priority. Hence it reveals the user dependency on internet for various academic purposes. User education is preferred by them to make themselves aware of various facilities, services and information resources that libraries are providing to them. They can exploit the resources at maximum and can avail all the facilities and services of the library, if they are aware of entire services and facilities well in advance. Therefore user orientation programmes should be organized at regular intervals.

**5.2 CONCLUSIONS AND RECOMMENDATIONS**

The main aim of the study was to analyze the role of librarian and staff in handling change dynamics and its impact on the users and functioning of libraries. After analyzing the data various inferences are drawn.

**5.2.1 CONCLUSIONS**

After the thorough study of management of technological changes in select agricultural institutions, the following conclusions can be drawn:

State agricultural universities and deemed universities are giving more attention to technological innovation in their respective libraries as compared to agricultural research
institutes and others. The motive to achieve academic excellence emerged out as the major compelling reason of introducing technological change by all the librarians of the agricultural institutions under study. The other compelling reasons are users' demands, online access and competencies in the field of library and information science. Another major reason is to expedite the services to users.

There are various management systems available to the manager of library and information centers. Libraries of agricultural institutions are using LIBSYS, LIBRIS and SOUL for managing library operations. Library personnel lack competency skills to manage these management systems and delivering services as per users' requirements. Empowering staff to manage these systems is essential for networking the information services so that information can be accessed via local and global networks. The majority of the agricultural institutions are using LIBSYS software for automating their operations followed by SOUL. YSPUHF is using both WINISIS and SOUL whereas NCAP is using TLSS (Total Library Solution Software) for automating its operations. LAN and E-mail facility is available in all the institutions under study. Intranet facility is also available in all the institutions except YSPUHF. wi-fi system is also available in IARI and they are soon planning to introduce RFID and CCTV facility. RFID technology is found only in SKAUST-J.

Librarians face lot of problems while implementing technological changes in the libraries. Shortage of qualified and skilled staff is felt by seventy percent librarians. Inadequate infrastructure, lack of funds, resistance by staff and internet bandwidth are the other problems faced by them during change process. Besides this, non-cooperative attitude of staff members also makes delay in the change process. Seventy percent of the librarians reported that their staff do not cooperate to a great extent while implementing technological change. Lack of awareness and lack of proper training are the reasons behind the non-cooperative attitude of staff members and resistance to change.

Librarians apply various methods to train and motivate staff members to participate in change process. Majority (seventy percent) of the librarian reported that they enhance the ICT skill of staff members to motivate staff to participate in change process. Sixty percent reported that they provide good infrastructure and discuss change process with staff members to win their confidence. Fifty percent librarians provide favorable working condition and ensure job security to overcome resistance and motivate staff. Training is also provided to update the knowledge and skills of staff members. In house training method is adopted by majority of the librarians to train
the staff followed by short-term refresher courses, training by computer specialists and seminar and conferences.

Libraries and information centers are adapting to the changing information environments by implementing technologies and providing information services to their clientele both physically and electronically via networks on 24x7 basis. But the fact is that, the success and effectiveness of these changes and services are not being measured by the libraries. It can be evaluated by taking feedbacks from users on regular intervals. Various strategies such as advance planning, SWOT analysis, participation and involvement of staff members, regular staff interactions and meeting, etc. can be adopted by librarians for effective management of change process. SWOT analysis is done to some extent by very few librarians. Regular staff meetings are held to a moderate extent to know the benefits of technologies implemented. The majority of the librarians are not even considering change management models before initiating change except SKAUST-K who reported that they consider Kurt Lewin’s three stage model and RACI model of change before implementing change.

Another setback in case of libraries of select agricultural institutions is that majority of these are only partially computerized. These are not able to provide automation in all areas like acquisition, circulation, serial control, technical processing, indexing and abstracting and collection of management statistics. The most significant factor responsible for this inadequacy appears to be insufficient budgetary provisions particularly for libraries. Except PAU, YSPUHF and NDRI, no other institution is allocating separate budgetary provisions for technological innovations in libraries.

Staff strength of research institutes is found very low as compared to State Agricultural Universities. The majority of the staff members employed in agricultural institutions possess MLIS qualification followed by BLIS, DLIS and C-Lib. Staff members reported that short term refresher courses are being organized by their institutions regularly to update their ICT skill. Already existing trained staff also guides them. They are able to take expert guidance from their seniors. Majority of the staff members are of view that refresher courses update their knowledge but not ICT skill. Thus they need practical demonstrations to handle ICT tools. Most of the courses are not ICT based. Seventy point six percent (70.6%) staff members are confident that they can assist users in locating information easily and rapidly if they are well versed with the usage of technologies.

The management of technological change in the libraries of agricultural institutions requires the involvement of each individual affected by change process. Fifty seven point three
percent members of library staff opines that their opinion is not considered before or while implementing changes because of which they are unaware of the role, they have to play. Involvement of individuals is essential to decline the resistance.

Majority of the staff members favor technological changes as they consider it necessary for the future growth of libraries and to serve the future generation. But still fifty point one percent staff members reported of resisting change because of various reasons. Lack of proper training is emerged as the major reason behind their resistance followed by inadequate infrastructure and lack of ICT skill to handle technologies. Despite the training being provided by library managers by organizing short term refresher courses, seminar, workshops etc., a large number of staff members still lack the required skill needed to work in the electronic information environment. The reason behind this lack of skill is insufficient exposure to computers and ICT tools during the course of training. All the members of library staff stress the need of formal as well as practical demonstration to enhance ICT skill. The positive association is found using correlation between variable such as Technology comfort vs. Change resistance; Technology comfort vs. Favor change and Technology comfort vs. Participation. This shows that these variables are significantly associated to each other as with the increase in technology comfort Participation and Favors to change also increases.

Types of information sources accessed by users vary as per their category, qualification and age. Majority of the users visit library to access books followed by general web sources. Books are major source of information for PG and UG students whereas printed journals and general web resources are good source of information for PhD, M. Phil and research scholars. Information sources accessed by users as per their age reveal that respondents with both, younger and older age group, uses books and printed journals as a source of information. E-resources are accessed by younger age group more as compared to older age group in the institutions under study.

Users’ awareness regarding the services and facilities provided by each institution is depicted through study. The users are well aware of internet facility, CD-Rom facility, reprography services, reference service and indexing/abstracting services, access to E-resources and Online Journals but are least aware of OPAC facility, CAS/SDI services, conference alert service, Audio/Video facility, translation services and Smart Card facility. This indicates that user orientation programmes are inadequate and librarians need to redesign these programmes and implement them effectively to make users aware of library sources and services.
The users rated the services they prefer in order of priority from their respective institutions in this technological era. Internet facility and user education are the most sought after services by users in all the agricultural institutions followed by access to e-resources and On-line journals, OPAC and CD-ROM database services. Conference alert service, audio/video facility and smart card facility are the least sought after services by all the respondents of all agricultural institutions.

End-user access is an important part of information services. The capabilities of staff play a vital role in assisting users in retrieving information using technologies. One hundred fifty users are of the view that the library staff lacks capability in assisting them in accessing and handling information using technologies. Beside this, a huge digital divide also exists among end-users which needs to be fulfilled by user orientation and training to enhance ICT skills. There are various types of methods adopted by users to enhance and update their ICT skills to get comfortable with the technologies for accessing information over net. Majority (214) of the users do self study for developing ICT skills followed by 146 users, who seek guidance of friends and 104 users get guidance from library staff. Trial and error method, short term refresher courses, practical demonstration of ICT applications and training by computer specialists are the other methods adopted by users to improve their ICT skills. Out of total 361 respondents, 355 respondents unanimously consider technological advances useful in assisting them in achieving academic excellence and to keep them up-to-date in their respective fields. Further, the study indicates that maximum (76.2%) users have voted net surfing as the major source of updating their knowledge followed by abstracting and indexing services and seminar/conference/workshops. This clearly shows the increasing dependency of users on internet and its tools.

Libraries need to be technology-driven and customer-oriented. With the development of ICT libraries are being transformed. They are now supposed to supply access to information resources, rather than locating and acquiring them. The appropriate use of technologies is necessary for making information easily accessible to the end-users. The libraries of the agricultural institutions are increasingly subscribing to e-journals to fulfill the users’ needs and to keep them updated. The quality of services depends on the infrastructure, ICT facilities and the technical competence of the staff available in the library.

Management of libraries is becoming a complex activity for library administrators as traditional aspects associated with library management are transforming into modern systems. The information needs of users are also changing and their dependency on the traditional library
is declining due to advances in electronic communication. The increasing diversity of users require wider and deeper subject specialisation on the part of information professionals. They need to acquire new competencies and skills not only to adapt change comfortably but also to serve today’s technology driven society. In the future, librarians will have to handle more complexed issues related to technological changes such as maintenance, development and control of the documents pertaining to a library collection in different forms and formats; legal, ethnic and technical issues; and increasing dependency of users on internet for their information needs.

Diverse kinds of information needs of individuals are fulfilled in different ways. To transfer agriculture information to farmers and to enhance their knowledge various extension services like Krishi Vigyan Kendras, Kisan Melas, Kisan call centers are located in different locations of a particular region to improve their labor productivity, increase their yields, and realize a better price for their agriculture production. Agriculture Technology Information Centers (ATICs) fulfill the information needs of various online farmers, rural entrepreneurs, extension workers and citizens interested in agriculture information. Central Government, State Governments and organizations like Indian Council of Agricultural Research (ICAR), National Academy of Agricultural Research Management (NAARM), National Information System on Agricultural Education Network in India (NISAGENET) and National Agricultural Innovation Project/National Agricultural Technology Project (NAIP/NATP) led by ICAR are contributing lot to promote agricultural research, education and extension services and providing financial assistance to various agricultural institutions for further development. The website of Agricultural Gateway of India (AG Info Gateway) is designed to satisfy the information needs of scientists, researchers, extension personnel, students, farmers, policy-makers, media, consumer groups, and agribusiness professionals in India. ARIS of ICAR, NICNET based AGRISNET and AGMARKTNET provides the state-of-the-art IT solutions to information management, information dissemination, and decision support requirements of the central as well as state governments, the corporate sector and the cooperative sector. Through this web based information system, farmers have choice to sell their produce in the nearest market at remunerative prices. e-Arik, a joint venture of Central Agricultural University (CAU) Arunachal Pradesh and Department of Scientific and Industrial Research (DSIR) e-Choupal, by ITC, e-Sagu by IIIT, Hyderabad also aims to develop farmer-specific and cost-effective agricultural knowledge dissemination system to farmers. Agrikhoj Search Engine developed by NISAGENET is designed to search information about agricultural education in India. CeRA and ICARNET Consortium also provide relevant agricultural information to diverse kinds of users.
To effectively access all these information sources effectively, users and staff members need extensive training and support from information managers.

5.2.2 RECOMMENDATIONS

Technological awareness at grass root level (i.e. users of agricultural libraries and farmers who ultimately are the real beneficiaries of information related to agriculture) is the key to exploit library resources at highest level. Librarians should organize orientation programs especially for farmers and users of rural regions in the area of ICT so that they can access information in their respective fields of interest.

Technology is the main force behind all the changes libraries are facing today. Proper management of technology and its tools is also necessary in order to establish a good relation between information services and their users in an environment of electronic information. It is possible only when librarian and other staff of library are well versed in the use of ICT tools to provide faster delivery of information in different forms and formats to end users.

Innovative and motivational leadership is necessary to lead changes successfully. Innovators think of new things all the time whereas sustainers accept the things the way they are. A librarian with innovative ideas can better plan change and motivate staff to participate in change process by teaching them the benefits of change. To be innovative, librarians need to keep themselves open to new and changing ideas as per users’ requirements. Librarians should increase their capability and capacity of risk taking to implement change successfully. They must have the ability/capacity to innovate and motivate their staff.

Professional qualification in the field of library science is the essential requirement for understanding the daily routine and conceptual framework of library. But in today’s digital environment, library staff should be ICT trained to manage library resources in different forms and formats and capable of designing and maintaining library websites and databases to integrate and coordinate various functions and services of libraries. Management training for the librarian, who is administering the library, is essential to help him in managing the tasks more efficiently and effectively.

For implementing technological innovations successfully, librarians need to plan budget wisely for all expenses. A separate budget should be earmarked for technological innovation so that expenses of technology implementation can be met positively.
Internet facility and user education are the most sought after services by users in all the agricultural institutions. Therefore, library professionals must enhance their ICT skills to serve the users in an environment where dependency on technology is increasing day by day. During survey it has been observed that there is a huge digital divide among users. Users especially from rural areas have less knowledge and are not well trained to access information easily using technological tools as compared to users from urban areas. Therefore, special training programme should be arranged for such users to develop their ICT skills in locating and accessing information in digital environment.

Application of ICT in select agricultural libraries has not reached a very high level. Lack of budget, lack of manpower, lack of skilled staff and lack of training are the main constraints for not automating library activities. Even though library professionals have shown a positive attitude towards the use of ICT applications and library automation, they need extensive and appropriate training to make use of ICT tools.

In order to implement change, the librarians need to develop a strategic plan. Their vision and objectives of change should be clear and user-oriented. The key to survival is change and it should be communicated effectively to staff in order to lessen resistance.

Change can be slow, sudden as well as planned. People generally resist when change is imposed on them. Imposed change calls immediate adjustments to the new scenario and situation. Therefore, change should be planned and communicated beforehand to staff in an effective way by telling them what, why, where and how of change. The role of each and every person involved in the change process should be well defined beforehand by the change manager to avoid role conflict while implementing change process.

It is advisable for librarian to predict the reaction of each individual who is acting as a change agent to implement technological changes and those affected by change well in time so that he can take the measures to address their grievances. Librarians should be of friendly nature and can have regular interaction and meetings with his staff so that they can convey their fear, doubts and problems regarding change process without any hesitation.

Seminars, conferences and workshops play a vital role in updating the knowledge of staff. But mere organizing seminars, conferences and workshops is not adequate; practical demonstration in the use of ICT and its tools is essential to handle information digitally. Library management can provide training to library staff (including librarian) especially in the area of e-resources management; web designing for creating, maintaining and updating library websites
and networking of information sources and services. Users should be given training in accessing online sources, various searching strategies, information systems and subject gateways in their respective areas.

The role of library has changed to that of an information centre, and role of library professionals has changed to that of information analyst with the increasing dependence on technology. The quality of service depends on the adequate infrastructure, ICT facilities and the technical competence of the staff available in the library. In case of libraries of agricultural institutions under study, the libraries are implementing various technologies for the faster delivery of information and services but mere implementation of technology with huge funding is not enough. Library management needs to empower staff and users by training them in the use of technology for maximum utilization of library sources and services. Even though ARIS labs are doing great job in providing online services to the users of agricultural information, but libraries have to make their presence felt by the users along with these labs by fulfilling their information needs.

Librarian should give priority to user-oriented services while planning technological change. He should design information systems in such a way that relevant information can be identified, retrieved, manipulated and delivered with the help of technology to each individual user. Public-access terminals in a Kiosk format and links to the Internet should be provided in the library building to educate users about library and its services and how the same can be accessed using ICT tools in a faster and easier way.

Libraries should maintain an extensive collection of agricultural information resources available over internet such as important agricultural networks (like NISAGENET, AGRISNET, AGMARKNET), subject gateways (like AG Info Gateway, j-gate) agricultural search engines (like Agrikhoj) and agricultural consortias like, CeRA, ICARNET consortium etc. Reference staff can easily access and supply information to users with the help of such resources. Moreover these resources and new arrivals should be publicised throughout the campus to maximize the use of agricultural information.

The management of technological changes in a library is a complex task. There are various library management systems/Software (LMS) available in the market such as LIBSYS, LIBRIS, SOUL, etc. While choosing any of the LMS, the emphasis should be on enhancing the efficiency and effectiveness of the library operations and delivery of services to the users of library. Appropriate hardware and software are necessary for this purpose.
The satisfaction of users regarding technologies implemented and services delivered should be taken into consideration for assessing, measuring and evaluating the performance of staff at all levels and measuring the effectiveness of technologies implemented in the libraries. For this purpose, regular feedbacks from the users can be taken to know the loop holes.

Advances in Information and Communication Technology (ICT) and the drastic growth of the internet over the past decade have considerably changed the information environment. The end users’ problems in accessing and retrieving information are also advancing due to lack of ICT skills, training and inadequate user orientation. Therefore, measures should be taken to educate and train users in locating and accessing information electronically.

Participation and involvement of staff in the change process is essential for the successful introduction and implementation of changes at the workplaces. Therefore, library administrators should allow and encourage staff participation in planning, introducing and implementing change process. Staff members are less likely to resist when they are themselves the part of plan of change in the library. Moreover, participation also helps in revealing the overall impact of change and removes uncertainties arisen among staff to a great extent.

Proposed changes should be discussed beforehand with the staff and deadlines should be set before staff members for successful implementation of change. Standards and targets are likely to be accomplished by deadlines in a more effective manner.

To develop customer oriented services an interactive user-librarian service system can be developed. It will help the librarian not only in judging the prevailing needs of the users but he can also guide users about the services and facilities offered by libraries. In this way the objective of user orientation can also be achieved.

Staff should see technological change as an opportunity rather than threat to serve the users in a better and faster way. Instead of resisting change, emphasis should be given more on improving their ICT skills to handle these changes. They can request the management for organizing special training program for them. They can have training by experts in the field of ICT.

Technical competence of staff varies from individual to individual. Some are comfortable to a great extent, some to a moderate extent and some are not comfortable at all. Therefore, a profile of each staff member can be created in order to record the competencies of each staff member and skills needed for each task during the implementation of technological changes.
This profile also helps to match employees to jobs. In this way staff members who need more training can be easily identified and trained accordingly. Moreover, it also helps in locating and recruiting suitable candidate for managing libraries with electronic environment.

The librarians should pre-examine the whole impact of change in achieving the goals of library. It helps in identifying ‘what is to be change’ and ‘at what degree’ and ‘how will it happen’. Librarians can perform research studies to determine how to best deal with the change and how to manage the constantly changing information environment, before implementing technological changes. During the implementation process, librarians need to report the problems and failures in adapting to technological change so that the same can be eradicated in future for successful implementation of change process.

After the thorough study of various change management strategies and existing change management models, the Change management cycle mentioned below is recommended for librarians to introduce technological change in the libraries. Librarian should not impose change on his staff as imposed change is most often met by resistance. He can follow the following steps to introduce change systematically in the library.

Steps to be followed in change management cycle:

- Recognizing the need to change
- Plan change
- Follow pre change analysis tools such as SWOT (Strengths Weaknesses Opportunities and Threats) analysis and Cost Benefit analysis (CBA). SWOT is meant to identify the strength and opportunities library have in their favor and to figure out threats and weaknesses which need to be worked out or handled before implementing change process. CBA helps to assess the financial competitiveness of library to decide whether to follow a course of action or not. It is essential while introducing technological changes as technological innovations require huge investment in initial stages.
- Thereafter a librarian should follow the following 4 C’s to implement change.
**Figure 5.1: 4 Cs to manage change in Libraries**

**Communicate Change:** The first ‘C’ in the figure starts with ‘Communication’. It refers to communicating change effectively to staff well in advance by explaining to them the need of change and the role they need to play in the change management process as change agents. Communication not only helps management in bringing into light their broad vision of change but also helps staff to understand the what, why, where and how of change.

**Connect People to Change:** The second ‘C’ here refers to ‘Connect’. Here the emphasis is on connecting staff to change process by addressing their uncertain fears and doubts about change and making them feel free to connect change.

**Cooperation and participation:** To make staff to participate in change, it is essential for library management to win the cooperation of staff. The main reason behind the non-cooperative attitude of staff is resistance which generally occurs because of various reasons such as unknown fears and doubts, vested interests, lack of trust or misunderstanding, differences in assessment of the situation, inadequate infrastructure, lack of incentives and ICT skill, etc. Resistance to change can be lessened through negotiation, education, training, participation, involvement, incentives, rewards and benefits.
**Change Implementation:** After communicating change effectively beforehand, connecting staff to change process and winning their cooperation in participating change implementation, the next step is initiation of implementing change process which must be followed by feedback from staff and users at the end. Librarian as change manager should make note of each and every difficulty face by him while implementing change process. He can consult various models of change management suggested in the study by various authors.

**Feedback from Staff and Customers:** All the 4 C’s must be followed by feedback from staff and customers. Feedback from staff helps library managers to further design training programmes for staff to remove difficulties faced by them, while enacting change and making them more competitive in handling change dynamics. Feedback not only helps the staff to convey their problems and fears openly to management but also helps management in understanding staff’s troubles and designing training programs accordingly. In the case of libraries, customers are the users of the library who enjoy the services of the library. Feedback from users helps library management in designing user orientation program by knowing users difficulties in accessing library services and resources in all formats. It not only maximizes the utilization of resources available in the library but also motivates the users to visit library. Feedback from users also helps in measuring the overall impact of technologies implemented in the libraries.

So, at the end of the study it can be concluded that the change is a constant in all the fields. It is essential for future survival. Libraries are also in the phase of transition due to constant developments in technology. The survival of libraries in changing scenario depends upon the ability and capability of library professionals to adapt change and to effectively manage it. A librarian as a change manager should recognize the need of change and initiate it by planning carefully in a systematic fashion so that it can be implemented easily and successfully. He has to win the cooperation and support of library staff by addressing their grievances to overcome resistance and has to improve their technical competence by the means of proper training. Library staff as change agents plays an important role in implementing change process. End users are needed to be trained in ICT so that they can easily access information in a technological environment. Various authors have suggested various approaches and strategies to manage these changes. Library managers or administrators will have to find the best alternative as per their library environment and users’ requirements for immediate service delivery and managing changes successfully.