CHAPTER I

1. Introduction

Information communication technology has come a long way in transforming and reshaping the way entire human race is functioning and it shall continue to reshape the way of life in the years to come. To understand higher education in the twenty-first century, we must look at Information Communication Technologies (ICT) on all aspects of Libraries. Most colleges and universities have recognized the changes in the Library administration and functioning, at least to some service. Many have modified existing setup or built new technology. Today's World Wide Web/Internet was originally created to speed up or enhance scientists’ collaborative activities. This potential of ICT has grown rapidly, especially as specialized collaborative software has come on the market in all disciplines, not just in the hard sciences. Essentially, ICT’s impact on academic Library has been longer and greater than it has been on instruction.

One of the more interesting technology relationships on academic campus is the one between the library and computing services. In a real sense, although both are fully committed to technology, they have diametrically opposite views about what the goal of
technology should be in an academic setting. The focus of computing services is on keeping the tightest possible security. Libraries on the other hand want the broadest possible open access as well as collaboration. Whatever their differences may be, these units must work together if the institution is to be successful in the long term. If they approach their working relationship as computing services providing the hardware and software needed to achieve an effective network on campus and the connectivity to the Internet, with the library providing much, if not most, of the network content everyone on the campus benefits from, there will be an effective use of technology.

1.1 Types and Characteristics of ICTs

The types of ICTs are classified into five categories on the basis of characteristics as follows.

- **Sensing Technologies**: These equipments gather data and translate them into form that can be understood by the computer. These include Sensors, Scanners, Keyboard, Mouse, Electronic pen, Touch or Digital boards, Biometric Device barcode sensors or readers, Voice recognition system.

- **Communication Technologies**: These are equipments that enable information to be transferred from the source to user. It also tries to overcome natural barriers to information transfer like speed and distance. Some of these include: Facsimile machines (fax), Telecommunication system, Telephone, Electronic mail, Teleconferencing and Electronic bulletin boards.
Display Technologies: These are output devices that form the interface between sensing, communication and analyzing technologies and human user. They include: Computer screen, LCD Projector, Printers and Television.

Analysis technologies: These are the technologies that help in the investigation or query of data, analysis and in-depth query for answers for simple to complex phenomena in research procedures. A complete set of a computer system could be a Micro, Mini, mainframe or Super computer.

Storage Technologies: These technologies facilitate the efficient and effective storage of information in a form that can be easily accessed. They include: Magnetic tapes, Discs, Optical discs and cassettes.

1.2 Components of ICT's

The main components of ICTs are:

- Computers
- Networking
- Internet
- Display screen technologies and peripherals
- Information systems
- Software
- Hardware(CPU, Printers, Digital camera and Audio visual equipments)
- Humanware (refers to skilled personnel).

1.3 ICT in Libraries
Libraries have a long history of using computer technology. Libraries, of all types, are examples of organizational environment that shift quite rapidly from dependence on manual systems to an almost total dependence on technology. They have employed most of the major computer systems starting in the 1960’s with mainframes, shifting to minicomputers in the late 1970’s, the client/server model in the 1980’s, then moving to Web-based technology in the 1990’s. Librarians demanded ever-growing functionality in the systems they acquired, and by the mid-1980’s the terms "integrated library system" was filling the professional literature, and more holdings were acquired in a digital format. Now it occupies a key stage in all aspects of academic library daily operations.

ICT has its impacts on every college libraries staff member and user. The administrative activities from frontline staff to the most senior librarian revolve around the use of technology, Acquisitions and cataloging activities have been computer based for years. Users remotely access services ranging from having reference questions answered to document delivery along with having 24/7 real-time access to databases. Having access to and using technology effectively and efficiently allows libraries to anticipate and quickly adjust to changing circumstances to meet the emerging needs of the stakeholders.

1.3.1 Planning and Administration

Long-Term Technology Planning and administration key factor in maintaining a successful ICT implementation involves careful long-range planning. Accurately predicting future changes in technology direction and the timing of those changes is almost impossible beyond 18 to 24 months. Nevertheless, the best insurance for
handling technology in as cost-effective manner as possible is developing at least a five-year plan.

By treating the process as a rolling plan, the benefits of long-term planning can be gained while maintaining the flexibility to adjust the plan to address the college library administration. What makes long-term technology planning somewhat different from other planning is the almost certain knowledge that the plan will probably never be carried out exactly the way presented, that each year will result in modifications as circumstances and technologies change.

College Library and IT managers must think about and plan for ICT from at least four viewpoints. Most important are the following strategic considerations:

Factors such as competitive differentiation

- Overall improvement in decision making
- Improved operational processes

Thinking about technology both offensively and defensively are also useful exercises. From an offensive perspective, considering how to achieve or realize maximum benefit from the use of ICT is vital. Defensively, thinking in terms of controlled growth and what has happening in similar libraries.

Critical success factors (CSFs) are the five or six areas where "things have to go right" or "failure will hurt performance the most." CSFs are very useful in technology planning, and in many ways they are easier to identify than organization-wide CSFs. From an academic library point of view, one of the technology CSFs is network reliability—both local and external connections to the Web. Another CSF is the reliability
of the integrated library system (ILS). One last example would be the integrity of the customer database. These factors become useful in planning the architecture and long-term needs of information service technology in a library setting. There are a number of models for technology planning; we favor Emberton's (1987) holistic approach. The following presents the holistic planning mode for information technology. The first step is to gain agreement on, or verify, that the current statement of the library's mission and goals reflects the actual try out. These are some examples of the critical success factors for information technology planning.
1.3.2 ICT impacts in College Library

Information Communication Technology impacts every library staff member and user. The administrative activities from frontline staff to the most senior Librarian revolve around the use of technology, acquisitions and cataloging activities have been computer based for years. Users remotely access services and questions answer to document delivery along with having 24/7 real-time access to databases. Having access to and using technology effectively and efficiently allows libraries to anticipate and quickly adjust to changing circumstances to meet the emerging needs of its readers.

1.4. Impetus of ICT Libraries

The fundamental reason for building ICT libraries is a belief that they will provide better delivery of information than was possible in the past. Traditional libraries are a fundamental part of society, but they are not perfect. Can we do better? Enthusiasts for ICT libraries point out that computers and networks have already changed the ways in which people communicate with each other. In some disciplines, they argue, a professional or a scholar is better served by sitting at a personal computer connected to a communications network than by making a visit to a library.

Information once available only to the professional is now directly available to all. From a personal computer, the user is able to consult materials that are stored on computers around the world. Conversely, all but the most diehard enthusiasts recognize that printed documents are so much a part of civilization that their dominant role in storing and conveying information cannot change except gradually. Though some important uses of printing may be replaced by electronic information, not everybody considers a large scale movement to electronic information desirable, even if it is
technically, economically, and legally feasible. Here are some of the potential benefits of ICT libraries.

The purpose of ICT library services is to enable the user to gain access the information required for knowledge enhancement. ICT library services include information about all the services, collections, digital resources, library instruction sessions and services. The specific services of ICT library include providing remote access to library resources—both printed and non-printed, service deliveries and generation of information on library. Depending upon the bylaws or regulations of the individual organizations, the access could be limited to members, or limited to certain resources like commercial database, where only members can access them through password.

1.5. ICT Facilities in Library Administration and Functioning

The development and availability of information and communication technologies (ICTs) in libraries have not only increased and broadened the impact of information resources at their doorsteps, but also placed more emphasis on effective and efficient services. Their applications in libraries, commonly known as library automation, have indeed continued to ease and promote quick and timely access to and transfer of information resources that are found dispensed round the globe. The following are some of the ICT facilities or resources that can be used for effective library operations and services

1.5.1 Library Information Technologies.
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1.5.2 Computer

Computer can be referred to as the backbone, nucleus or hub of ICT application. In virtual ICT applications, the computer is interfaced with another devices in order to function effectively.
1.5.3 Internet Facility

Internet is described as a worldwide network of computer and people. Built upon state of the art technology, the internet makes it possible for thousands of dissimilar physical networks that are not connected to one another and that use diverse hardware technologies to connect and operate as a single communication system. There are locations of various types of information on computer system linked to the internet. It is an important tool for global online services.

1.5.4 Video Conferencing

Through video conferencing, people at different locations in the world could be allowed to hold meetings. Offorma (2000) describes video conferencing as a means of linking up two or more remote computers, all of which have a small camera attached which enables the participants to see each other, to speak to each other and in some systems, to be able to start, send documents through the linked computer. Some libraries use this medium to source for information that is not available in their own libraries and at the same time, use this great medium to create awareness to users who are ignorant of the availability of information resources in the library.

1.5.5 Electronic Mail (E-mail)

This medium can also be used to send and receive mails. This is commonly and widely used with the internet facilities. E-mail is very useful for sending messages to and from remote areas with enhanced network.

1.5.6 Networks

This is a system of interconnected computers for sharing information and resources (Olusanya and Oloyede) this may involve two or more computers in a single
office or several computers in different units across an organization or across the country. The networks include the local area network (LAN) and wide area network (WAN). With computer network, libraries can access and share information in different locations and download for users’ needs.

1.5.7 Electronic resources

The ever-increasing volume of e-resources requires the modern academic library to deploy new solutions for managing e-materials and providing access to them. New paradigms, differing significantly from those used in the traditional paper-driven environment, allow patrons to maximize the advantages of electronic media while providing staff with the tools to effectively manage these resources.

Library automation with ICT provides a complete solution for managing the full spectrum of library materials and processes, offers a family of e-resource products that can be used on a stand-alone basis or as part of an integrated system.

1.5.8 Expert System

Vast amounts of information may be gathered, synthesized and manipulated before decisions are made or conclusion arrived at the some of the complex area of human knowledge. According to Burton (1992) expert systems encapsulate the knowledge and experience of the human expert and make them available to a wider audience. Within information work, expert systems have been applied in the area of cataloguing, classification and information retrieval

1.6. Use of ICT in Academic Libraries
Libraries that establish a server and web site may offer any combination of the following to enhance their services to users.

i) Basic library information such as, hours of operation contact people, address and policies. There is an opportunity to make such information more interesting than through other media such as through the inclusion of pictures of staff, a short sound file or direct e-mail links which allow users to send messages.

ii) New ways of access to Library facilities such as:

- Book request forms that can be completed by users and then converted into catalogue data.
- Remote access catalogues Improved OPAC search facilities
- Showcase to Library resources such as library tours or video of story time etc.
- New information services such as home page linked to a collection of Electronic texts, Databases and other Internet resources (such access can be designed for specific user groups, such as student or the house bound)
- Access to resources of the on-line hosts

iii) Interactive home pages, offering facilities such as:

- Fill-in forms to be used for feedback and services
- Requests for purchases, reservations of college library materials and generally library suggestions
- Inter library loan and circulation reference questions

iv) Links to remote information and connection to information resources around the world. Library staff can identify hot list and bookmark files of frequently used resources for support in answering frequently asked questions. Other users of Internet support
some of the operations of Librarians and thereby have an indirect impact on customer service. These include,

- **Staff development** :- World Wide Web service, offers staff the opportunity to keep involved in the developments in this field.

- **Acquisitions**:- The Internet can provide access to database provided by publishers of books and journals, book sellers and journal distributors.

- **Cataloguing and Classification of Web pages** :- Can be used to distribute and access the rules schemes and recommendations concerning Catalogue and Classification.

- **Inter library lending and document delivery** :- The use of the networked public access catalogues of other Libraries document delivery services and others can support the identification of required document.

- **On-line Search Services**: - The on-line search services are a range of data bases upon a large computer system and offer users access to the Databases

1.7 Functions of ICT

1.7.1. Searching and Browsing

Paper documents are convenient to read, but finding information that is stored on paper can be difficult. Despite the myriad of secondary tools and the skill of reference librarians, using a large library can be a tough challenge. A claim that used to be made for traditional libraries is that they stimulate serendipity, because readers stumble across unexpected items of value. The truth is that libraries are full of useful materials that readers discover only by accident.

1.7.2. Shared Information
Libraries and archives contain much information that is unique. Placing digital information on a network makes it available to everybody. Many digital libraries or electronic publications are maintained at a single central site, perhaps with a few duplicate copies strategically placed around the world. This is a vast improvement over expensive physical duplication of scarcely used material, or the inconvenience of unique material that is unobtainable without travelling to the location where it is stored.

1.7.3 Easier to Keep Current Information

Much important information needs to be updated continually. Printed materials are awkward to update, since the entire document must be reprinted and all copies of the old version must be tracked down and replaced. Keeping information current is less laborious when the definitive version is in digital format and stored on a central computer.

1.7.4 Availability of Information

The doors of the ICT library never close; a recent study at a Indian university found that about half the use of a library's digital collections was at hours when the library buildings were closed. Materials are never checked out to other readers, mishelved, or stolen, they are never in an off-campus warehouse. The scope of the collections expands beyond the walls of the library. Private papers in an office or in a library on the other side of the world are as easy to use as materials in the local library.

1.7.5 Easy to Information update

Print is not always the best way to record and disseminate information. A database may be the best way to store census data, so that it can be analyzed by
computer. Satellite data can be rendered in many different ways. A mathematics library can store mathematical expressions as computer symbols that can be manipulated by means of a program such as Mathematica or Maple. Even when the formats are similar, materials created explicitly for the digital world are not the same as materials originally designed for paper or other media. Words that are spoken have a different impact from words that are written, and online textual materials are subtly different from either the spoken or the printed word.

1.7.6 Reduce staff members

In a few cases, libraries were able to reduce staff that were involved with labour-intensive, manual processes with high volumes of activity once the ICT had been installed. However, for a majority of libraries, there has been little or no reduction in the number of overall staff as the result of automation (many staff members have been moved to public service positions).

1.7.7 Reduce unit cost of operation

The efficiencies that can be achieved with an ICT allow a library to reduce the costs associated with a particular activity. For example, sharing cataloging data through a bibliographic utility such as OCLC allowed libraries to avoid duplicating the effort associated with creating original cataloging records. This reduced the number of professional staff and resulted in delegating work to lower skilled and lower-paid staff.

1.7.8 Improve control

An ICT will accurately record the status and location of all items that are maintained in its database. Thus, rather than having silos of paper records found only in
one department, the online system allows every staff member to learn about and update information associated with a particular item or record.

1.7.9 Reduce errors

Using an ICT means that the number of errors that would have occurred in a manual system are significantly reduced, because the majority of systems use barcode scanners to uniquely identify an item.

1.7.10 Improve speed

Using an automated system means that a variety of activities are completed in a timelier manner. For example, materials are getting on the shelves faster, circulation related transactions happen quicker, and so forth.

1.7.11 Improved access.

Because the majority of library staff members have desktop that are connected to the server, they each have access to the latest information about an item or record. In addition, the ICT will typically provide several indexes to the library's database (e.g., keyword indexes) that are not available with manual systems.

1.7.12 Increase range and depth of service

An ICT, especially a system that is accessible via the Internet, allows the library’s reader to access the library's collection and other information resources 24 hours a day, 7 days a week. In addition, most systems will allow library patrons to view portions of their record, place holds, or be alerted when an item is available. Thus, the library patron is no longer constrained to visiting the physical library in order to receive services.
1.7.13 Facilitate cooperation

The ability of an ICT to export standard MARC records allows libraries to participate in various cooperative projects (building local, regional, and state databases: lists of serials owned by participating libraries; and so forth).

1.7.14 Impacts on OPACs.

With the introduction of the OPAC in the early 1980’s, several studies have been conducted to identify the problems encountered by OPAC users, as well as to make suggestions for improving the OPAC experience.’ Initially there were three main benefits that resulted when an OPAC was introduced into a library. These benefits included:

1.7.15. Reduced costs to provide a library catalogue

No more filing cards! Because the largest component of the average library's budget is for personnel costs, eliminating the time it took to maintain and file cards in the library's card catalog resulted in significant savings. These cost savings accrue to the library on an annual basis, although this is frequently overlooked by a number of library staff and funding decision makers internet access. Thus, library patrons now had around the clock access to the library's collection from their home office, or dormitory.

1.7.16 Immediate access to location and status information

Given the remote access to the library's collection and other information resources, one of the real benefits for the patron is being able to determine whether an item of interest can be found on the shelves or if it is checked out or missing. This allows the patron to discover the status of an item before making a trip to the library.

1.7.17 Impacts of Online Databases
The database industry is one that is strong and growing. Vendors provide access to a variety of Data-text, Numeric, Images, Sound, and Video files. A rich diversity of databases exists: 71 percent are word-oriented, 17 percent are number-oriented, and 7 percent are image/picture-oriented. Database producers who create and provide these databases might be the primary publisher or a secondary publisher. Secondary publications include citations, abstracts, or other materials descriptions created by the primary or original publisher. In some cases, several databases are gathered together by a database distributor (e.g., Lexus/Nexus, ProQuest, or Dialog). In other instances, a database is only accessible via the primary publisher. Traditionally, librarians have provided a value added service by providing search intermediation services. Currently, end users seek direct access to these resources, which are often licensed by the library for use by its user base (i.e., as a sort of intranet).

1.7.18 Impacts on Reference

Online catalogs may have started displacing physical card catalogues in the 1980s, but mediated online searching, typically performed by reference librarians, was added to extend, not replace, the print collection. CD-ROM workstations and locally loaded databases that were added in the 1980s were intended to complement the resources available in the library. Then came the increase in Internet use in the 1990s and the access to online databases and other information resources that it provided. These newer technologies seldom replace the technologies already in place, but more often are likely to coexist with those prior services.

1.7.18. Impacts on Acquisitions

ICT has had several important impacts on acquisitions:
Reduction of paper and filing costs

Eliminate duplicate orders by checking an on-order file and the library's catalog

Able to download MARC records at time of order, which reduces time, costs, and occurrence of error

Access to easy-to-use currency conversion tables

Management reports to monitor vendor performance

Tools to track the spending of the library's entire materials acquisitions budget

Limited access to online reviews, although this is improving each year.

1.7.19 Impact on Periodical

Managing serials is an important task that can consume significant staff resources in a non-automated setting. The ordering, renewal, invoicing, check-in, claims, binding and dealing with cancellations are all processes that require attention to details while a majority of systems support the receipt of Journal issues and allow the library to define a variety of arrival predication patterns, few systems support the MARC Format for Holdings at both the detail and summary holding levels. The CONSER (CONversion of SERials) Project has helped libraries build a database of serials-related bibliographic records. The benefits of automating serials are:

- Increased control over receipt of issues. This allows the journal issues to get into the hands of the end user sooner. It also allows for the more timely and accurate claiming of issues that do not arrive.

- Production and maintenance of routing lists.

- Production of local, regional, and state serial holding lists.
➢ Management reports about the usage of each serial title.
1.7.20 Impact on Check-in and Check-out

Vendor-provided automated circulation systems, first introduced in the early 1970’s, support a wide range of circulation related activities. These systems introduced libraries to the concept of using barcodes as a way to uniquely identify each item in the collection. Using barcode scanners at the circulation desk speeded up the checkout and check-in process. The net effect of an automated circulation system is improved control over the library’s collection and increased staff productivity.

1.7.21 Role of ICT in Effective Library Services

Neankwo (2006), opines that ICTs application to library works and services could be seen as the best way that could be used to assist researchers to adequately solve their literature need for effective research activities. This, according to the writer, is because the application of ICT to library operations greatly helps in the provision of efficient reference and information services, the utilization of network operations such as Cataloguing, Authority control, Inter library loans and Cooperation and in the participation of international bibliographic project. Also Dike (2000) claimed that instant access to information from a multiplicity of source is one of the major roles of ICT application to library services. Not only can it help in locating the materials where the required information can be found easily but ICT helps in sorting out what information is relevant from a mass of irrelevant information.

1.8 Academic Library Administration and impact of ICT

The academic library is not an end in itself Librarianship is not managing collections; rather, there is a growing realization that other resources: human, technical, financial, and technological must to be managed effectively. The rapid pace of
development in the field of information communication technology and the advent of technology information services has prompted a comprehensive review of library.

The librarian must have the leadership, communication, presentation, and interpersonal skills to steer academic libraries through guidance, advice and mentor. A library transformed into a new information service unit, providing electronic cataloging, electronic on-line public access catalogue (OPAC), electronic acquisition and serials control, electronic inter-library loan and electronic circulation functions. Modern ICT facilities can also provide content and information dissemination by means such as electronic theses and dissertations. Students can benefit from millions of pages of relevant information on the web if the college can provide adequate ICT facilities to these academic libraries. The existing fear and resistance regarding the right to communicate, have access to information, and exchange experiences and ideas via Internet connectivity should not be tolerated.

The role of strategic and long-range planning is important as the roles of libraries and librarians are being redefined. The library's instructional mission must be viewed as essential to the survival of the library and its supporting functions, especially in terms of planning for new technologies that will be used in and out of the library itself.

1.8 Need of the Study

The survey arose from a need felt by the College librarians of affiliated to Madurai Kamaraj University to trace the impact of Information Communication Technology on administration and functioning. ICT has a high impact on all components of the academic library system in India, especially Library administration and functions.
Though information is considered as an important resource, the use of ICT tools to collect and disseminate information has been in a slow pace in majority of the college libraries. This may be due to various factors like insufficient funds, inadequate staff trained in handling computers and software packages, administrative concern, etc. Change is a permanent phenomenon. This applies to college libraries also. The change affects the administration as well as functioning of college libraries. During these changes, the librarians have to equip themselves with necessary expertise and managerial capabilities. Effective organizations only can survive is a general phenomena. Libraries as service institutions have to keep in pace with the changing environment. Hence there is a need to study the administration and functioning of college libraries in order to bring out a good image for the Librarians lest the librarians will be left behind.

1.9. Statement of the problem

Considering the enormous benefits that are experienced in the impact of ICT in college Library, it has become an important subject for all information providers. This is because of its relevance and application to tasks in the Library such as quick and easier ways of performing increased workload of library tasks with greater efficiency, enables library to establish positive correlation in the networked world, concretizes the prospects and hope for information users as academic library are now involved in resource sharing enabled by ICT, enhances adequate ICT for easy accessibility of information needed by patrons in college library, enables academic Library precisely universities to fully adopt the use of ICT in information handling and library activities/services such as indexing, cataloguing, reference and information retrieval services, circulation, serial
control/ management and the provision of other technical services. Despite its acclaimed relevance and as tool to drive the 21st century ICTs in libraries,
1.10 Organisation of the Report

This report is organized into five sections namely:

- Chapter 1 Introduction
- Chapter II Review of Literature
- Chapter III Research Methodology
- Chapter IV Analysis
- Chapter V Findings, conclusion and suggestions for further research
Reference


