

## **Information & Communication Technology in Libraries**

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Meaning of ICT (Information and Communication Technology) is capturing, processing, storing and communicating information in electronic form. It may be a group of tools and techniques that helps in generation of information, collection, and storing, retrieving, searching, viewing, updating and communicating information using electronics machines. It includes the group of hardware's, software's, services and networks that allow access of digital information.

### **Concept of ICT**

ICT is made with three different words;

1. Information
2. Communication
3. Technology

### **Information:**

Information is nothing but a systematic arrangement of data which can be considered as a national resource like food, air, water, shelter, cloth and power as basic needs of human commodities. In the Library and Information Science field, "information" was used first time in 1958 in place of "document". In today's scenario, the change has accepted on its merit on the basis of economics, utility, simplicity and efficiency in performance and some other criteria's. This moves toward information oriented society of the next century called innovation in generation, collection, storage, processing and dissemination of information.

**The International Encyclopedia of Information and Library Science has given a clear statement of information:**

“Information is an assemblage of data in a comprehensible form capable of communication and use: facts to which a meaning has been attached. Within information technology or information processing, the term is used in a more general sense to encompass all the different ways of representing facts, events and concepts within computer-based systems. In this usage, it concludes data, structured text, text, images and video.”

**The American Society for Information Science and Technology highlights to Information Science as:**

“Information science is that discipline that investigates the properties and behavior of information, the forces governing the flow of information and the means of processing information or optimum accessibility and usability. It is concerned with that body of knowledge relating to the origination, collection, organization, storage, retrieval, interpretation, transmission, transformation, and utilization of information. This includes the investigation of information representations in both natural and artificial systems, the use of codes for efficient message transmission, and the study of information processing devices and techniques such as computers and their programming systems. It is an interdisciplinary science derived from and related to such fields as mathematics, logic, linguistics, psychology, computer technology, operations research, the graphic arts, communications, library science, management, and other similar fields. It has both a pure science component, which inquires into the subject without regard to its application, and an applied science component, which develops services and products.”

## **Communication**

The transmission of information, ideas, emotion or attitudes from one person or group to another is called Communication.

### **As per Wikipedia,**

“Communication is the activity of conveying information through the exchange of thoughts, messages, or information, as by speech, visuals, signals, writing, or behavior”.

The communication requires a sender, a message, and a recipient. The communication process is complete once the receiver received the message sent by the sender.

### **Communication Technology:**

The development of communication technology is a sign of man's hard work to communicate rapidly over great distances. The computer lies as a heart of modern communication system and new technology called communication is emerging, from the fusion of computer and communication technologies. With the advancement of telecommunications from the technological point of view, a massive shift from analog to digital modes of transmission could be seen. This shift has enormous capacity with this new transmission channel. It also involves all types of communications namely voice, facsimile, computer transmissions and television communication, which will all be affected.

### History of Communication

Year	Event
1830	Electrical Telecommunication systems started.
1838	Electric Telegraph
1843	first Fax Machine
1876	Invention of the telephone.
1880	Photo phone
1887	Invented the Gramophone
1894	Wireless Telegraph
1896	Radio
1898	First telephone answering machine
1927	First Television broadcasts in England
1930	Videophone
1934	First Tape Recorder.
1951	Computers are first sold commercially
1958	Invented Xerox Machine/Photocopier
1964	Fiber Optic Telecommunication
1969	ARPANET, first Internet started, Computer Networking.
1971	The computer Floppy disc invented.
1979	First Cellular phone communication network started.
1981	Analog Cellular Mobile Phones.
1983	Internet.
1985	CD-ROMS in computers.
1994	American government released control of Internet and WWW is born making communication at light speed.
1998	Satellite Phones.
2002	Internet Research Steering Group
2003	First World Summit on the Information Society
2005	Second World Summits on the Information Society.
2006	Internet Governance Forum Established by UN, SG
2007	USC/ICANN Transition Agreement
2009	Internet Usage Becomes More Global
2010	The Global Politics of Internet Governance

Source: This table was generated from [http://openbookproject.net/course/into\\_2ICT/history.html](http://openbookproject.net/course/into_2ICT/history.html) (25 September, 2012)

## Technology (Computer Technology)

As per Wikipedia,

“Computer is a machine that can be instructed to carry out arbitrary sequences of arithmetic or logical operations automatically via computer programming.”

Computer is performing a system of logical operations in accordance with variable set of procedural instructions (programs) to produce a result in the form of information or signals. The necessary function of computer technology is input, output, processor and memory (primary and secondary).

History of computer is:

Year	Developments
<b>Mechanical Computing Devices</b>	
1900	Analytical Engine
1908	Hollerith Tabulator
1911	Monroe Calculator
1919	IBM Tabulator
1928	National Ellis 3000
<b>Electromechanical (Relay Based)</b>	
1939	Zuse 2
1940	Bell Calculator Model 1
1941	Zuse 3
<b>Vacuum-Tube Computers</b>	
1943	Colossus
1946	ENIAC
1948	IBM SSEC
1949	EDSAC , BINAC
1951	Univac I
1953	Univac 1103, IBM 70
1954	EDVAC
1955	Whirlwind, IBM 704
<b>Discrete Transistor Computers</b>	
1958	Datamatic 100, Univac II
1959	Mobidic, IBM 7090

1960	IBM 1620, DEC PDP-1
1962	Univac III
1964	CDC 6600
1965	IBM 1130, DEC PDP-8
1966	IBM 360 Model 75
<b>Integrated Circuit Computers</b>	
1968	1968 DEC PDP-10
1973	1973 Intellec-8, Data General Nova
1975	1975 Altair 8800
1977	1977 Apple II
1979	1979 DEC VAX 11 Model 780
1980	1980 IBM PC
1982	1982 IBM PC, Compaq Portable
1984	1984 Apple Macintosh
1986	1986 Compaq Deskpro 386
1987	1987 Apple Mac II
1993	1993 Pentium PC
1996	1996 Pentium I PC
1998	1998 Pentium II PC
2000	2000 Digital Computer
2002	2002 Expert Systems and Data compression
2003	2003 SAIT
2006	2006 Storage Tek T 10000
2007	2007 IBM 3592
2008	2008 IBM TS 1130

**Source:** This table was generated Foster, Nick “The impact of emerging technology on Business, industry, commerce and humanity during the 21st century in Vision, Vol.10 (4),Oct-December 2006, 1-28

On the basis of development, computer can be divided into 5 generations:

1. 1946-60 (development of vacuum tubes)
2. 1960-64 (development of transistors)
3. 1965-70 (development of integrated circuits)
4. 1971-85 (development of large scale and very large scale integrated circuits)
5. 1985 onwards (development of Artificial intelligence)

## **Information and Communication Technology (ICT)**

ICT is made with three words Information, Communication and Technology, we can define it “Communication of Information with the help of Technology”.

### **The Wikipedia highlights to ICT as;**

“ICT is an extended term for information communication technology (ICT) which stresses the role of unified communications and the integration of telecommunications (telephone lines and wireless signals), computers as well as necessary enterprise software, middleware, storage, and audio-visual systems, which enable users to access, store, transmit, and manipulate information”.

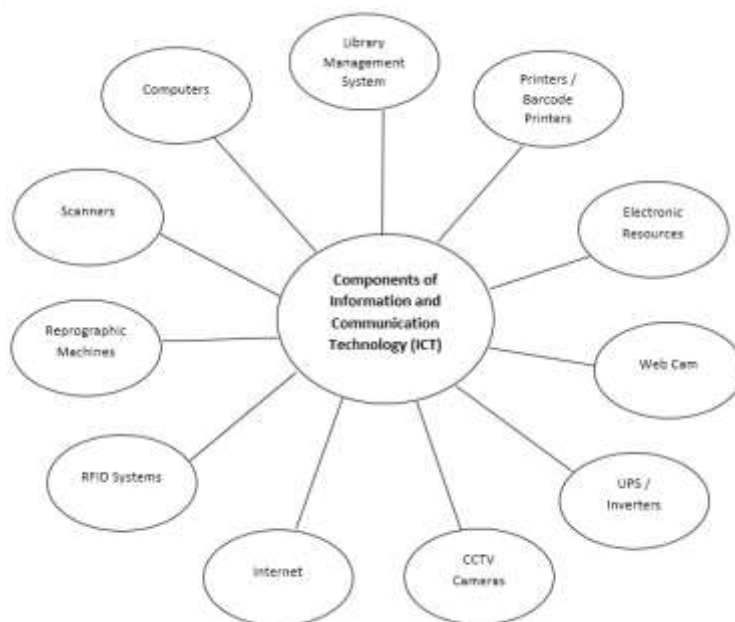
So ICT is the infrastructure and components that enable modern computing. There is no single, universal definition of Information and Communications Technology ICT, the term is generally accepted to mean all devices, networking components, applications and systems that combined allow people and organizations (i.e., businesses, nonprofit agencies, governments and criminal enterprises) to interact in the digital world

The main components of ICT infrastructure in Engineering and Management College Libraries are:

- Computers (PC and Laptops)
- Library Management Software (Automation and Digitization)
- Printers / Barcode Printers
- Scanners
- Reprography Machines

- CD-ROM
- RFID System
- Internet
- CCTV Camera
- UPS/Inverter
- Web Cam
- Electronic Information Resources etc.

These components can be divided in two parts, Hardware & software. Hardware is the collection of all parts which we can touch physically, like: PC, Printers, Scanners, and Reprography Machines etc. Software is a general term for the various kinds of programs used to operate computers and related devices, like: Library Management software etc. ICT infrastructure is never completed without networks. So we can say that ICT infrastructure is a combination of Hardware, Software & Networks.



**Components of ICT**



## **ICT in Libraries:**

Effectiveness of engineering & management college libraries services is now largely depends upon the ICT. The main factors which required to move traditional library system and services into ICT based library services are:

### **1. Problems faced by traditional library systems in the information explosion era:**

In traditional library system where entire system and services are manual and it is very difficult to perform / fulfill the users need in the current era with the same. In this era size of information is growing very fast and the space available in the libraries are very limited. No library can add additional space every year as compare to grow the information. Due to information explosion requirement of information is very high but in traditional libraries where resources are limited, they cannot fulfill the needs. In the operational part traditional libraries takes many hours to perform due to potential growth of information also effectiveness and accuracy will not be up to the standard as compared to the ICT Based Library systems.

### **2. Better Facilities in ICT Based Libraries than Traditional Libraries**

2<sup>nd</sup> main factor to convert traditional libraries in ICT based libraries is the facilities are provided by computer and related technology based libraries. ICT based libraries can provide information in much higher speed than traditional libraries also computers can store voluminous data than traditional library systems.

Computers can perform functions very accurately, the data gathered in computers are reliable as computers and all related technologies have long life. A can be used repetitively to process information and computers are very compact these days they don't occupy more space.

Following activities can be done through ICT in Libraries with speedy services & access: Acquisition, Cataloguing, Circulation, Bibliography, Serials Control, Inter library loan, preparing in house databases. The use of ICT in Libraries saves time in storing information, information handling, information processing and information retrieval. Technical library operations and procedures are done with higher speed and the time lag between the acquisition of documents and their availability to users will be reduced significantly. ICT provides an extended role to libraries in terms of increasing the range of their services, linkages with institutions and for sharing their resources and expertise.

On the behalf of above factors we can say that ICT based library and information centers can perform much better speed & accuracy than traditional library systems. So these factors will force us to convert our library and information centers ICT based from traditional systems.

### **Conclusion:**

ICT infrastructure is an important resource of a modern library or information Centre. Due to ICT libraries have not only remarkably changed in their operations and services, also identified new and active roles for librarians. With using ICT Librarians can facilitate speedy library operations & services. Impact of ICT on information services is characterized by changes in format, contents and methods of production & delivery of information products, emergence of Internet as largest

repository of information and knowledge, changed role of LIS professional from intermediary to facilitator, new tools for dissemination of information, shift from physical to virtual service environment, and extinction of some conventional information services and emergence of new and innovative web based Library Services.

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