

APPLICATION OF INFORMATION TECHNOLOGY IN LIBRARIES: AN OVERVIEW

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ABSTRACT

Information is an indispensable for human development as air is essential for the survival of all living organisms on earth, including human beings. The pace of change brought about by new information technologies has a key effect on the way people live, work, and play worldwide. The increasing role played by information technology in the development of library services for an active reaction to the challenges of the information service providing. The paper attempts to discuss the fast development of Information Technology and its application in the library services. Today libraries are equipped to accomplish the newly Information Technology based services. Information Technology enabled services fulfill the information needs of the users at the right time in the right place to the right person.

Key words: Information Technology, Libraries, Electronic Library, Digital Library, E-Resources

1 INTRODUCTION

Information is the key factor of any kind of research and development. Information is a fundamental resource which is essential for survival in today's competitive and wired world. The information itself and way it is accessed have undergone changes owing to the developments in information and communication technology. It is a vital ingredient for socio-economic and cultural development of any nation or individual. According to Kemp "Information is considered as the fifth need of man ranking after air, water, food and shelter"¹. The value of information in every human endeavor cannot be overstressed. Quick and easy access to every required information is a supreme importance especially for libraries². Information technology application and the techniques are being used by the libraries for information processing, storage, communication, dissemination of information, automation etc. Further, origin of internet and the development of World Wide Web revolutionized the information communication technology. Recognizing the advantages application of information technology the libraries are essential to provide the facilities to their user community³.

2 INFORMATION

Information is universal- it is known to all men in all languages, there may or may not be precise or apt word in a language to describe the term 'information' but surely it is there. We receive the information throughout the day. According to Shannon and Weaver

‘Information is any stimulus that reduces uncertainty’. Another definition by Ching- Chin Chen and Peter Hernon defines information as “all knowledge, ideas, facts, data and imaginative works of mind which are communicated formally and or informally in any format”.

This information that is so vital to human life, where does it come from? An in-depth study of how information is generated would be a difficult task, but it can be safely be concluded that research is one of the better known areas where information takes root. Most of what we know today is a result of research. The work of experts in the fields of science, technology, social science and the humanities continue to give birth to information that is beneficial to the whole society. The government, understanding the major role that R&D plays, also continues to pour funds into these fields as a result of which more and more information is generated- so much so that the world is being bombarded with information leading to the phenomenon termed ‘information explosion’⁴.

3 INFORMATION NEED

The Librarian’s Thesaurus defines information need as “that need which library services or materials are intended to satisfy”⁵.

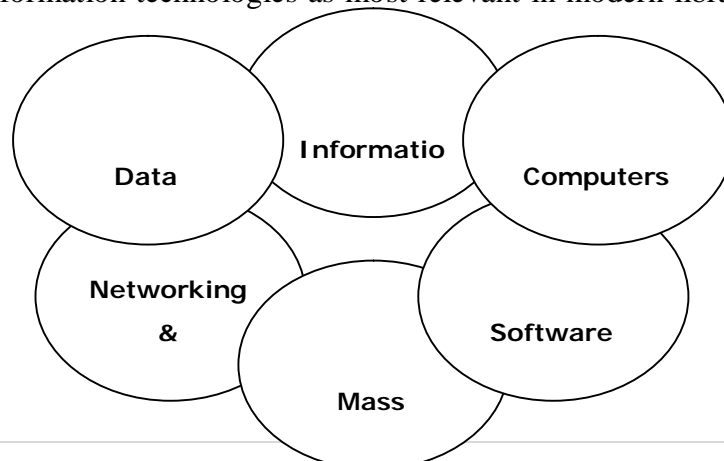
Maurice B. Line has defined information need as, “what an individual ought to have for his work, his research, his edification, his recreation etc”⁶.

4 INFORMATION TECHNOLOGY

- a) According to the Webster’s New encyclopedia, “Information Technology is the collective term for various technologies involved in the processing and transmission of Information they include computing telecommunications and microelectronics”⁷.
- b) According to ALA Glossary “Information Technology as the application of computers and technologies to the acquisition, organization, storage, retrieval and dissemination of information”⁸.
- c) According to the British Department of Industry, it defines Information Technology as “The acquisition, processing, storage and dissemination of vocal, pictorial, textual and numerical information by microelectronics based combination of computing and telecommunication”⁹.

4.1 COMPONENTS OF INFORMATION TECHNOLOGY

Technological change is becoming a driving force in our society. Information technology is a generic term used for a group of technologies. Following are the major components of information technologies as most relevant in modern library and information system.



4.2 INFORMATION TECHNOLOGY: INFRASTRUCTURE

The adaptation of any new technology requires the presence of an infrastructure with which it acquires, learn and successfully apply the technology. This includes sufficiently available human resources, well developed telecommunication networks, research and development capabilities and capital for investments¹⁰.

5 APPLICATION OF INFORMATION TECHNOLOGY IN LIBRARY

The library is the main information centre which can make use of the fast development IT for the benefits of mankind as a whole. The librarian's preference of IT should include all those technologies which are expected to be used in the library activities/ operations and other library services for collection, processing, storage, retrieval and dissemination of recorded information, the fast developing information technologies have showered almost every areas of application including libraries. In case of libraries, these are good use in the following environments.

- a) **Library Management:** Library management includes the following activities which will certainly be geared up by the use of these fast IT developments: Classification, Cataloguing, Indexing, Database creation, Database Indexing.
- b) **Library Automation:** Library automation is the concept of reducing the human intervention in all the library services so that any user can receive the desired information with the maximum comfort and at the lowest cost. Major areas of the automation can be classified into two -organization of all library databases and all housekeeping operations of library.
- c) **Library Networking:** Library networking means a group of Libraries and information Centres are interconnected for some common pattern or design for information exchange and communication with a view to improve efficiency.
- d) **Audio-Video Technology:** It includes photography, microfilms, microfiches, audio and tapes, printing, optical disk etc.
- e) **Technical Communication:** Technical Communication consisting of technical writing, editing, publishing, DTP systems etc.¹¹

6 IMPACT OF INFORMATION TECHNOLOGY IN LIBRARY

The IT has wide ranging impact on library and information work. Information activities have undergone rapid transformations from conventional methods, consequent upon introduction of new technologies. This summarized with the help of a table.

SL. NO.	INFORMATION ACTIVITY	CONVENTIONAL METHOD	NEW TECHNOLOGY
1.	Generate, Originate	Writing, Typing	Word Processing, Text editing, Character Recognition, voice Recognition
2.	Preserve, Store	Manuscript, Paper-Print Media	Electronic Publishing, Magnetic Storage, Videotext, Tele-text. Computer disk, ROM
3.	Process	Classification, Cataloguing, Indexing	Electronic data processing, Artificial intelligence/ Expert systems.
4.	Retrieval	Catalogues, Indexes	Database management system, Information retrieval off-line, On-line.
5.	Disseminate/ Communicate	Lists, Bibliographies, Abstracts, Hard Copies	Electronic mail, Electronic document delivery, Computer conferencing ,

			Telefacsimile, View data
6.	Destroy	Physical weeding	Magnetic erasers, Optical erasers, re-use the medium ¹² .

7 ADVANTAGES AND DISADVANTAGES OF INFORMATION TECHNOLOGY

All computer based systems should be user friendly and should satisfy as many of the following factors as possible:

Some of the advantages of information technology include:

- a. Easy to gather different library activities.
- b. Collaboration and creation of library networks
- c. Avoid repetition of efforts within a library
- d. Increase the range of services offered
- e. Save the time of the users
- f. Increases efficiency
- g. Speedy and easy access of information
- h. Improves the quality of library services
- i. Enhance the knowledge and experience
- j. Integration within the organizations.
- k. Improve the status of the library
- l. Improve the communication facilities
- m. More stable
- n. Helps to attract the users.
- o. Remote access to users
- p. Round the clock access to users
- q. Access to unlimited information form different sources
- r. More up to date information
- s. Information flexibility to the users
- t. Reforming and combining of data from different sources
- u. Reduce the workload of the library staff

Some disadvantages of information technology include:

- a. Insufficient funds
- b. Operational costs are exceeding year by year.
- c. Inadequate trained staff
- d. Unemployment¹³.

8 CLASSIFICATION OF INFORMATION TECHNOLOGY BASED SERVICES

Information technology based services can organize on the basis of three main criteria.

- I. Apparatus and Amenities
- II. Customer Services
- III. Electronic Sources

- I. Apparatus and Amenities:** The equipments and facilities available in the library are illuminating in the following headings.
- a) **Computers:** Computer-based technologies have become dominant forces to shape and reshape the products and services the academic library has to offer. The success of the IT enabled services in the library is based on the efficiency of the equipment provided in the library i.e. most modern technology, not on the basis of number of equipments.
 - b) **OPAC:** An Online Public Access Catalog (OPAC) is an [online database](#) of materials held by a [library](#) or group of libraries. Users search a [library catalog](#) principally to locate books and other material physically located at a library ¹⁴.
 - c) **Union Catalogue:** A union catalog is a combined [library catalog](#) describing the collections of a number of [libraries](#). Union catalogs have been created in a range of media, including [book](#) format, microform, cards and more recently, networked electronic [databases](#). Union catalogs are useful to [librarians](#), as they assist in locating and requesting materials from other libraries through [interlibrary loan](#) service ¹⁵.
 - d) **CD-ROM:** Presents a state-of-the-art review of the applications of CD-ROMs in academic libraries, embracing all aspects of library involvement and staffing implications. Concludes that CD-ROM is having a huge impact on the way academic libraries function and the services they offer to their users ¹⁶.
 - e) **Scanner:** In computing, an image scanner—often abbreviated to just scanner— is a device that optically scans images, printed text, [handwriting](#), or an object, and converts it to a [digital image](#).. Mechanically driven scanners that move the document are typically used for large-format documents, where a flatbed design would be impractical ¹⁷.
 - f) **RFID:** Radio frequency identification is a term used for technologies utilizing radio waves for identifying individual items automatically. The most common way is storing a serial number identifying a product and related information on a microchip attached to an antenna. RFID is used very similar to bar codes ¹⁸.
 - g) **Tele text:** Teletext is a [television](#) information retrieval service developed in the [United Kingdom](#) in the early 1970s. It offers a range of text-based information, typically including national, international and sporting news, weather and TV schedules. Teletext information is broadcast in the [vertical blanking interval](#) between image frames in a broadcast television signal ¹⁹.
 - h) **Facsimile:** A facsimile is a copy or reproduction of an old [book](#), [manuscript](#), map, art, or other item of historical value that is as true to the original source as possible. It differs from other forms of reproduction by attempting to replicate the source as accurately as possible in terms of scale, color, condition, and other material qualities. For books and manuscripts, this also entails a complete copy of all pages; hence an incomplete copy is a "partial facsimile" ²⁰.
 - i) **Photocopy:** A photocopier is a machine that makes [paper](#) copies of documents and other visual images quickly and cheaply. Most current photocopiers use a technology called [xerography](#), a dry process using heat. Photocopying is widely used in library ²¹.

- j) **Printing technology:** In computing, a printer is a [peripheral](#) which produces a text and/or graphics of documents stored in electronic form, usually on physical print media such as paper or transparencies ²².
- k) **Barcode:** A barcode reader (or barcode scanner) is an electronic device for reading printed [barcodes](#). Like a [flatbed scanner](#), it consists of a light source, a lens and a light sensor translating optical impulses into electrical ones. Additionally, nearly all barcode readers contain decoder circuitry analyzing the barcode's image data provided by the sensor and sending the barcode's content to the scanner's output port ²³.

II. Customer Services

- a) **Document delivery services:** The Document Delivery Service (DDS) delivers copies of journal articles and book chapters from [participating Libraries](#). Fees apply for most Document Delivery Services. To fulfill the information needs of the end user through information/document supply is a document delivery service. This service is provided on No Profit - No Loss Basis and Expected to be prompt ²⁴.
- b) **Interlibrary loan:** Inter library loan means a cooperative arrangement among libraries by which one library may borrow material from another library. In other words a loan of library materials by one library to another library.
- c) **Indexing and abstracting services:** a method which is used to retrieve information from a table in memory or a file on a direct access store or the art of compiling an index. The preparation of abstracts, usually in a limited field, by an individual, an industrial organization of restricted use or a commercial organization: the abstracts being published and supplied regularly to subscribers. Also the organization producing the abstracts. Such services may be either comprehensive or selective ²⁵.
- d) **Chat services:** Online chat may refer to any kind of [communication](#) over the [Internet](#), that offers an instantaneous transmission of [text-based](#) messages from sender to receiver, hence the delay for visual access to the sent message shall not hamper the flow of communications in any of the directions. Online chat may address as well [point-to-point](#) communications as well as [multicast](#) communications from one sender to many receivers ²⁶.
- e) **CAS:** The purpose of a current-awareness service is to inform the users about new acquisitions in their libraries. Public libraries in particular have used display boards and shelves to draw attention to recent additions, and many libraries produce complete or selective lists for circulation to patrons. Some libraries have adopted a practice of selective dissemination of information ²⁷.
- f) **SDI:** Selective dissemination of information ("SDI") was originally a phrase related to library and information science. SDI refers to tools and resources used to keep a user informed of new resources on specified topics. Selective Dissemination of Information (SDI) was a concept first described by [Hans Peter Luhn](#) of IBM in the 1950's ²⁸.
- g) **Scanned copies:** A scanning service for material not available electronically, which is held by the Library. This includes articles from journals and chapters from books.

Users of the service should be aware that we operate within the restrictions of the Copyright Act ²⁹.

- h) **Bulletin board services:** A Bulletin Board System, or BBS, is a [computer system](#) running [software](#) that allows [users](#) to [connect](#) and [log in](#) to the system using a terminal. Once logged in, a [user](#) can perform functions such as [uploading and downloading](#) software and data, reading news and bulletins, and exchanging messages with other [users](#), either through [electronic mail](#) or in public [message boards](#) ³⁰.
- i) **Electronic services and e- resources:** The important fact is convincing many libraries to move towards digital e-resources, which are found to be less expensive and more useful for easy access. This is especially helpful to distant learners who have limited time to access the libraries from outside by internet access to commonly available electronic resources, mainly CD-ROM, OPACs, E-Journals, E-Books, ETD and Internet, which are replacing the print media ³¹.
- j) **Digital library:** A digital library is a [library](#) in which collections are stored in digital formats and accessible by computers. The digital content may be stored locally, or accessed remotely via computer networks. A digital library is a type of [information retrieval](#) system ³².

III. Electronic Sources

- a) **Audiovisual materials:** The Audiovisual Collection contains a wide range of audiovisual material to support the research and study needs of staff and students ³³.
- b) **Internet:** With the advent of digital revolution, communication has become easier and faster and decision are mad instantaneously. The internet which is the latest among the superhighways has cut down the distance and made it easier to have access to information to all people at all places and at all the times ³⁴.
- c) **Library website:** Library website helps to recognize the facilities and information sources available in the library. In most of the library website online catalogue is included. Online catalogue helps to ascertain a client whether the information is available in the library.
- d) **Database:** A database is an organized collection of data for one or more purposes, usually in digital form. The data are typically organized to model relevant aspects of reality, in a way that supports processes requiring the information ³⁵.

9 CONCLUSION

As eventual remarks, it is reminded that libraries are operating in a quickly changing situation, they should be aware of latest technologies to continue and maintain the importance of the service offerings. Utilization of Information Technology in present libraries is optimistic to gain right information at the right time in the right place and at the right cost. Information Technology helps to progress the rank of the library and it condense the work stack of the library professions. Information Technology has broken the worldwide boundaries, new apparatus and methods help to provide better services to our clients.

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