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Managing Libraries and Information with Technology

Dhanashree A. Date, *Library Executive*, Tata Infotech Ltd, SEEPZ, Andheri (E), Mumbai –400096 E-mail: dhanashree.date@tatainfotech.com

[*The influx of an ever-explosive information in library and information centres, through varied information sources, and in a mixed media format, has drastically changed the patterns of information services and its administration.*

This paper explores the possible interfaces of library and information science with sophisticated information technology (IT), which helps elicit code, store, to finally disseminate and manage information in various library infrastructures effectively.

The conclusion follows the observations entailing from today's IT-Library synergy.]

1. INTRODUCTION

Information today is recognised as a very valuable and powerful resource, forcing information management disciplines to become highly professional and technologically updated. All information in any recorded format can be conveyed in one common format—digital. This paints the vision of a sweeping and awesome potential of information access and its communication. It also speaks of a need for effective management of that access, and of a powerful and flexible structuring of information. With the rapid growth of science and technology, the wealth of

information has been prolific. Thus, never has the need to manage it been more critical.

Library and Information managers are these days deluged with advice on how to acquire and organise learning resources to satisfy the complex and ever increasing information needs of their users. Knowledge of professional techniques, user needs, IT applications and its management in terms of appropriate and optimum use to deliver information, will instil confidence in meeting the challenges successfully.

2. TECHNOLOGICAL DEVELOPMENTS IN LIBRARIES

Early computer applications in libraries were largely used for data processing, and primarily viewed as efficient record storage and retrieval systems. In the 1960s, it became possible to collect small amounts of text, typically bibliographic data and use Boolean logic for queries. A few years later, as storage and processing capabilities expanded and abstracts were added, ranked retrieval using probabilistic approaches became feasible.

Now, after 30 years of information retrieval research, large full-text collections have grown. Friendly front-end programs and performance support systems, having in-built job aids to assist the user by on-line help and elaborate menus, have contributed to smoothen the retrieval and manipulation of information, e.g.: Library software packages like Libsys and SLIM. New retrieval technologies like the Web search engines, e.g.: Yahoo, AltaVista and Lycos facilitated end-user access.

Today, decentralised organisational structures involve many cross-functional processes for acquiring and distributing information. Here, networked libraries help facilitate remote access and information sharing, e.g.: library networks like DELNET, BONET, or branch library networks on LANs help libraries of a cliché to exchange the decentralised information repositories.

The library and information science world has long addressed the concerns of digital libraries (DLs). Experts in Library and Information Science fields define DLs

as 'collections of digital objects with some organising or collection principle, serving a well-defined community of users, with suitable intellectual property rights management, and with mechanisms for preservation' [1]. DLs will endeavour at helping more people benefit from growing collections of well-organised information, available in digital forms. Clearly DLs will contain multimedia information (text, images, audio and even video), and therefore will be built on the basis of multimedia-related technologies.

The outburst of tremendous technological development witnessed in the last few decades has revolutionised information management to the extent that information will very soon be omnipresent, and no longer confined to the four walls of a library. This situation is already in the pipeline with the evolution of 'Virtual Libraries', which will be the talk of the next millennium.

3. NEED FOR IT IN LIBRARY AND INFORMATION MANAGEMENT

- Changed concept of a library is a mixed-media library. For this, libraries need to be equipped with multimedia technological aids to elicit code, store, retrieve and disseminate information.
- New types of literacy are now emerging—media literacy and computer literacy. Libraries compliment the education and training systems in supporting these literacy skills within the society. Therefore, library and information managers need to educate and upgrade their technological skills to be able to serve their users better.
- Today, new paradigms of information access have created the need for apt, concise and timely dissemination. Technological applications work as refined, improved and effective analysis tools towards fulfilling user requirements and avoiding information overload.
- Information is now thrown into public networks. A networked library capability makes it possible for users to access it when, how and where they need.

- Technology has made it possible to collate information from various source points and package it to be accessible from a single source point, while delivering it to the user. This has increased the agility of information availability.

3.1 Application of IT Resources

Appendix I shows the most commonly used IT resources. They are categorised according to their core functionality by which they enhance library services and are not mutually exclusive. However, this categorisation is a useful guideline for planning and implementing IT in an appropriate library setup. The type of library wherein each resource can be more appropriately used is also mentioned.

A survey was conducted, for this paper, with the objective of gathering factual data of IT usage in a cross-section of libraries within Mumbai. The most commonly used IT resources within these libraries is also illustrated in this Appendix.

3.2 Deployment of it into Library Functions

Similar to traditional libraries, information acquisition, storage / retrieval, dissemination and library administration are the broad functions of any library even today. However, IT-Library interface has brought about a marked change in the way these functions are carried out today.

3.2.1 Acquisition

Collection building in a wide assortment of forms and through various sources is a major change due to IT.

- E-mail has become a dominant mode of communication between librarians, users and vendors. It is preferred for its features like record maintenance, follow-up, convenience and timeliness.
- Centrally stored and simultaneously accessible information over the CD-Servers and Computer-based technology tremendously cut down the cost of duplicate purchases.

- Advent of Internet and Intranet is fast replacing the traditional bulky union catalogue.
- Intranets enable sharing of internal library information, thus avoiding unnecessary duplication of purchases. It is a speedy channel for receiving user suggestions.
- Internet throws open a still wider array of global information sources by means of publisher/vendor catalogues, virtual bookstores like *Amazon.com* and the 'OCLC First Search' [2] Electronic Collections On-line Service, wherein institutions can subscribe to the electronic version of journals available and also renew their accounts.
- E-Commerce, the emerging concept of on-line acquisition, includes a wide range of activities from marketing, order placements, invoicing, payments, distribution, to customer service. Benefits include redundancy of labour, timeliness of delivery, integration of vendors and customers, accuracy of information and ease of access.

3.2.2 Storage/Retrieval

Space crunch is a perennial problem in any library. Much of this problem is overcome due to the use of digital technology for mass storage.

- Electronic communication media such as e-mail cuts on the space occupied by bulky library correspondence record files.
- Library catalogues and listings are centrally stored on Intranets.
- Internet is a one-stop place that stores enormous user relevant information.
- Microforms and Scanners are useful for document preservation and management.
- CD-Server stores massive data, and gives the users enough flexibility of time, place and choice of data to be accessed.

3.2.3 Dissemination

Library is a service organisation. Almost always, the information dissemination service provided by libraries is intangible. Today, customers set the standard for any product or service. It is the dissemination service on which the user

decides the success or failure of a library. It has tremendous power in satisfying user needs, with IT resources directly working at information spread.

- E-mail, Intranet, Internet provide newsgroups as a forum of discussion and learning.
- Library *home pages* provide updated information. Bulletin boards and newsgroups are aimed at target user groups with the aid of 'push' technologies. They work as excellent CAS/SDI services. Ready reference sources like dictionaries, directories, encyclopaedias are made available on the Intranet.
- Web-based OPAC is a one-stop integrated search for library databases and open networked information. Search engines like *Copernic* allow simultaneous searches on the most important search engines.
- Quality in information dissemination is easily maintained with IT. E.g.: CD-ROMs maintain high quality outputs and Computer-based Technology (CBT) gives a uniform input of information to every learner unlike the print format.
- Information dissemination with IT is an open access system, which enables users to learn and acquire information at their convenience, choose what is relevant, learn and evaluate at one's own pace. E.g.: CBT allows the user to learn without a tutor.
- IT resources are excellent tools to market library services, e.g.: Intranet and IVR flash new library services. *InfoKiosk*—a touch-screen technology is an interesting library guide and a good attention-grabber, which allows users to know about library layout and facilities with the aid of a video-shoot along with browsers to satisfy repetitive queries.

3.2.4 Administration

The favourable impact of IT in library administration is directly related to:

- Redundancy of labour by reducing clerical jobs, e.g.: e-mail has replaced letter posting; Intranets have in-built library users' directory, to facilitate sending reminders.

- Cutting of travel costs, e.g.: Video/data conferencing help in real-time communication, saving travel costs. A classic example is IGNOU. Stationery costs have considerably reduced. E.g.: hand scanners help in on-line circulation, reminders and letters are in the electronic format. Though not paperless, it is definitely working towards a less-paper work environ.
- Saving time both of the librarian and the users as networked data is easily accessed from a convenient place and time. Repetitive user queries can be efficiently handled by Interactive Voice Responses (IVR) just over a telephone call.
- Centralised information control reduces mishandling, losses and wear and tear.
- IT has helped libraries in increasing their customer service levels by rendering services that are timely, consistent and to be able to provide them beyond the library hours, thus being more responsive to the users.
- Statistical analysis and logistics of the usage of library services is precise and easy to determine with the help of system generated reports—which enable librarians to evaluate, analyse, modify and manage library services effectively.

3.3 Implementing IT—Some Points to Consider

- Have a 'Vision Statement'—clearly stating the goals
- Focus on needs—identification of core and most demanding areas
- Cost effectiveness—implementation, support and maintenance cost
- Develop a strategic plan and library structure—action plan, policy decision, centralised/decentralised resources, facilities
- Communication, training and orientation—train staff and users for optimum use, avoid misuse and market services
- Efficient Operation—use all features, ensure quantification of services and ensure data safety
- Learning from the best—benchmark services to adopt what suits best, continuous quality improvement

4. OBSERVATION

In the 21st century, a gradual shift in terms of library collections and services is visible, and it is more pronounced in special libraries. Although paper still remains a widely used form of information source, CD-ROMs, e-mails and Internet are readily used technologies. Prestigious libraries like the Asiatic library have already replaced microforms with CD-ROMs. Library software packages have largely enhanced areas of documentation, on-line catalogues, OPAC and circulation. However, varsity libraries, which have a vast collection, are still in the process of retrospective conversion.

Internet is clearly an asset to all libraries, and the user demand is proportionately more than what the library infrastructure can offer. The importance placed on data sharing is evident from the efforts that have been put in by the BCL and IIT libraries in setting up LANs and Internet *home pages* that help in spreading awareness about their libraries. Corporate libraries look at Intranets as a better option to propagate library information.

Some shortfalls of IT implementation brought forth in the survey show a lack of value addition in information that is disseminated through Internet. Download and transfer takes place on as-is basis. Libraries are often seen to be 'renting' Internet machines to the users rather than using search and retrieval skills of their professional staff.

User and professional staff acceptance to IT is favourable and clearly customer service levels are on the rise. Formal training on IT to the library staff is largely overlooked. Availability of funds is a major deciding factor in the level of IT implementation. An accomplished fact that the potential benefits of IT far outweigh the cost of its implementation does not seem to be well embraced.

E-Commerce and total systems integration (See Appendix II) are areas that need to be explored. Utilising existing personnel power resources in addition to IT, is an equilibrium that library managers must achieve.

5. CONCLUSION

Library and information centres are in a state of metamorphosis. Networked information has shifted the onus of information search from librarians to the users. Library related technologies allow direct interaction with the users, leaving very little or no intervention from librarians.

IT thus makes it incumbent upon the information managers to learn new skills of structuring and presenting data in electronic media format. Innovative means of packaging and pushing information should be mastered. Sharing of IT experiences and know-how through frequent hands-on experiences will make library professionals IT savvy. Recently, Tata Infotech organised a seminar at SEEPZ, Mumbai, where a group of city librarians were provided an opportunity to *use* and *have a feel* of the IT resources used by the Company's libraries across the country.

Exploring the IT potential, and using the IT-Library synergy to render qualitative services, should be the mission of every information manager today.

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Appendix I—IT RESOURCES FOR LIBRARIES

Storage/Retrieval	Communication	Dissemination
*Microform **	*E-mail ****	*Intranet ***
Information in paper form is photographically reduced and stored in the form of a roll, film, card-readable on microform reader	Written messages passed between two or more computers through computer networks and/or via telephone lines	Private computer network that uses internet technology to enable members on the network to communicate
Appropriate to– Engineering, Press Archival libraries	*Appropriate to–* All libraries	*Appropriate to–* Branch and academic libraries
*Digital Audio Tape **	*On-Line chat **	*Internet ****
A high precision magnetic tape storage medium for recording digitally encoded information.	Real-time written communication with one or more people through computers	A group of LAN that has been connected by means of a common communication protocol
Appropriate to– Large libraries	*Appropriate to–* Branch libraries	*Appropriate to–* All libraries
*CD-ROM Server ***	*Video/Data Conferencing **	*Computer-Based Training **
Allows all users on a network to share the centrally stored CD-ROM Information simultaneously	Real-Time communication with one or more people using video camera and voice. Data conferencing enable sharing & editing of data by multi users simultaneously	Learning with the help of computer aids *Appropriate to–* Training, Academic, Public, & Children's libraries
Appropriate to– Public, Special libraries Training Institutes	*Appropriate to–* Branch, Academic libraries, Training Institutes	
Scanner	*Interactive Voice Response **	*InfoKiosk **
Device which digitises optical image into electronic image.	Generates and executes voice response application over telephone lines which are linked to library data.	A freestanding computer or terminal that provides information to the public, usually through a multimedia display.
Appropriate to– Engineering, Press, & Archival libraries	*Appropriate to–* Large libraries	*Appropriate to–* Children & large campus libraries

***** No usage ****** Minimum usage ******* Maximum usage

Appendix II—AREAS OF SYSTEMS INTEGRATION IN LIBRARIES

- Circulation data with e-mails—for reminders
- Circulation data with IVR–for circulation status
- Circulation data with Barcode scanner—for on-line circulation
- OPAC data with IVR—for reference queries
- OPAC with web-browser—for integrated information retrieval and dissemination of library (single and branch) information along with Internet information
- Intranet with e-mails—Intranet for receiving information requests through e-mails, one-stop search for all branch library data, value-added information dissemination like posting relevant newsgroups through e-mail mailing lists–organisation-wide
- Internet with e-mails—for collection development and on-line acquisitions, posting acquisition and referral information from Internet onto user e-mails, e.g.: book reviews and recommendations to user