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Multimedia Systems in Libraries and their Applications

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Abstract

Multimedia is a combination of text, graphics, animation, audio and video, converted from different formats into a uniformat digital media and hypertext is non-sequential writing or reading. Multimedia prepared in hypertext environment is called Hypermedia. This paper describes multimedia, its applications and limitations in general. The need for multimedia in libraries and its use for various applications in US and Europe such as multimedia library information kiosks, walk-through programmes, training, digital libraries, multimedia databases, multimedia catalogues, multimedia library collections, geographical information systems, electronic publishing, etc are also discussed.

1. INTRODUCTION

The primary functions of a library are to collect, organise, preserve and deliver information to the users. With the passage of time, several techniques and technologies have emerged for handling the information more speedily and effectively. Invention of printing in the second half of the 15th century started a revolution in spreading thought and scholarship. Later, still pictures (microfilm, 1839; negative film, 1841), moving pictures (cine film, 1870; video tape and TV, 1908), sound recordings discs, (1877); sound tapes, (1899), microcomputers and view data (1945) and optical storage systems (1985) were introduced in the commercial market which had an everlasting impact on publishing. Slowly all these recording media, used for storing information, were introduced in the libraries. All these forms were acquired and stored separately because the information retrieval methods used were different for each form of the media. As a result combining information from different forms became difficult.

In 1940s, efforts were made by Dr Vannevar Bush to integrate all these forms and he designed a mechanical device, called Memex[7], for storing, organising and retrieving information received in various forms. Those days librarians used to collect non-book material and call them as multi-media collection. However, there was no single platform on which all the forms of information could be stored and retrieved. During the late 1980s, computer specialists succeeded in integrating the text, graphics, animation, audio, and video information on a computer after converting them into digital media (homogeneous media) called multimedia for publicity purposes. This is a major achievement in the field of publishing, which directly influenced both librarians and users.

2. WHAT IS MULTIMEDIA/ HYPERMEDIA?

Multimedia is a combination of some or all forms such as text, data, images, photographs, animation, audio and video, which are converted from different formats into a

uniformat digital media and is delivered by computers. Unlike the analogue media (TV programmes) the digital media which allows users to manipulate according to the needs, use at their pace, and interact at any point of the program. When a multimedia program is developed in a hypertext environment, the resulting product is called hypermedia. So multimedia would then be a part of the hypermedia. All hypermedia products are multimedia products but not vice versa. The basic difference between hypermedia and multimedia is in the organisation and linkages of the information fragments. The information chunks/fragments in multimedia are organised linearly whereas in hypermedia, these are organised non-linearly with links to each other.

The main elements of the multimedia are :

(a) Text: information about an object/ event, etc; notes, captions, subtitles, contents, indexes, dictionaries, and help facilities.

(b) Data: tables, charts, graphs, spreadsheets, statistics, and raw data.

(c) Graphics: both traditional and computer generated (vector form) such as drawings, prints, maps, etc.

(d) Photographic images : (raster form): negatives, slides, prints (both from digital still & video cameras and scanned photographs).

(e) Animation: including both computer generated, video, etc.

(f) Audio: including speech and music digitised from cassettes, tapes, CDs, etc.

(g) Video (digital): either converted from analogue film or entirely created within a computer.

A multimedia system records, processes, stores and delivers all types of information in binary code the same way as a computer does. This is quite different from the traditional analogue technology of radio, TV, A-V tapes, gramophone records, or the combination of digital audio and analogue video in interactive video discs. The main advantage of a digital format is theflexibility in combining, transmitting, manipulating and customising the elements of the multimedia according to the needs of the user.

Basically, a multimedia system will have a powerful PC with high-end graphics processor, a sound card (to play and record sound), CD drive, and multimedia extensions and drivers for playing digital audio and video. Now a days, major systems that are used for desktop multimedia design include IBM's PS/2, Apple's PowerMac, Commodore's Amiga, NeXT's Nextstation Colour, and Silicon Graphics IRIS Indigo. There are a wide variety of application software commercially available for all computer platforms. The most popular and inexpensive among all these (low-end software) are the HyperCard on Mac, and ToolBook on PC compatibles. On the other hand, there are a number of authoring packages for high-end multimedia design. The popular ones include Macromedia's Director for both Mac and PC platforms and Icon Author for PC. HyperCard is a popular Hypermedia toolkit for Mac and is being used extensively in libraries for designing various applications during post 1980s and early 1990s.

3. APPLICATIONS OF MULTIMEDIA

Multimedia systems are being used for many purposes by different people in different organisations/offices/environment. The main functions include media integration, storing, organisation and dissemination at different places in different ways. This paper attempted in reviewing the use of multimedia for library and information services (ref. 20, 22, 24, 34, 36, 41, 42, 56) in various countries from the published literature. Some of the general applications of multimedia are given below :

- Instruction/training and technical presentations
- Multimedia communications such as multimedia e-mail, personal conferencing, video phones, video conferencing, etc.
- Public information points/kiosks for libraries, museums, hospitals, tourists sites, monuments, etc.
- Medical information systems
- Multimedia databases, multimedia information banks

- Multimedia newsletters, multimedia books, other information resources
- Reference tools, e.g. encyclopaedias, directories, etc.
- Archival systems
- Geographical information systems
- Electronic publishing & bookselling
- Point-of-sale displays,
- Product information catalogues
- Technical documentation, including engineering drawings, specifications, etc.
- Architectural information displays for example walk-through programmes for the new buildings or constructions/already constructed buildings/monuments
- Entertainment, leisure, home
- Exhibitions such as conferences, trade shows, new product, facilities, museums, libraries, etc.
- Interactive displays in museums, hospitals, libraries, etc

Tourism is one of the industries that has exploited the full strength of multimedia for developing tourist information systems for public and libraries[27, 30]. Glasgow Online is one of the best tourist information systems designed by the University of Strathclyde during 1989 using HyperCard software[26]. Afterwards several commercial multimedia information products were introduced in the market.

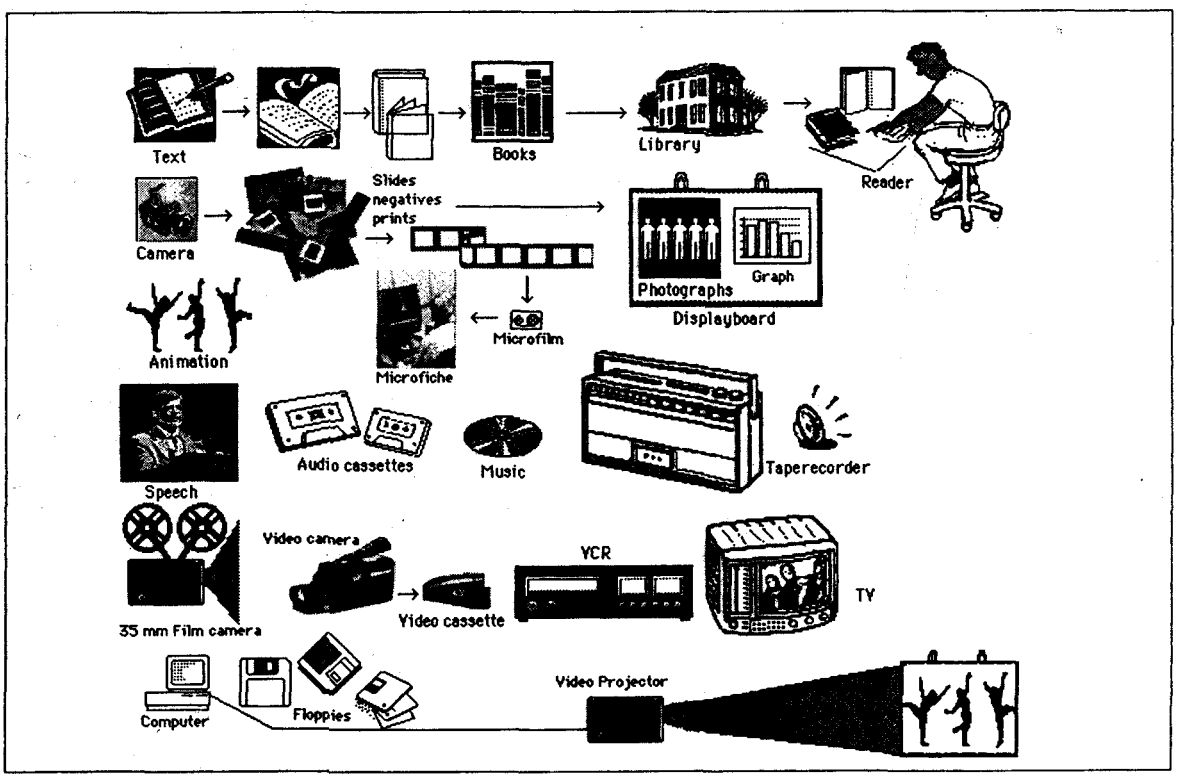
4. MULTIMEDIA APPLICATIONS IN LIBRARIES

Hypermedia, not only helps the users in providing information from different media (print, microforms, audio and video) on one platform (integrated) but also saves on space, money, maintenance, operational inconveniences, etc.

The other advantages of multimedia in libraries are:

(a) It can help satisfying different information needs such as reference, enrichment, entertainment, leisure, etc.

(b) It can help meeting various types of information preferences of the users such as scholarly, scientific, vocational, artistic, recreational, etc.



(c) Being in digital format, information can also be accessed by remote users on a network. It also helps in over coming the barriers of boundaries, proximity and physical capacity of a library to accommodate users.

(d) It is interesting and easy to use over the existing form such as print, microforms, online, etc.

(e) Its control and interactivity helps the users and provides the benefits of books (information) and human beings (interactivity).

Electronic information, and multimedia in general, is about to become a vital part of our cultural heritage. Libraries have throughout the history ensured a democratic, independent and free access to the knowledge and intellectual value represented by conventional books. It is evident that this principle is also valid for electronic information and multimedia. The availability of multimedia information through data networks may also open completely new ways for the libraries to obtain information for the common users.

4.1 American and European Libraries

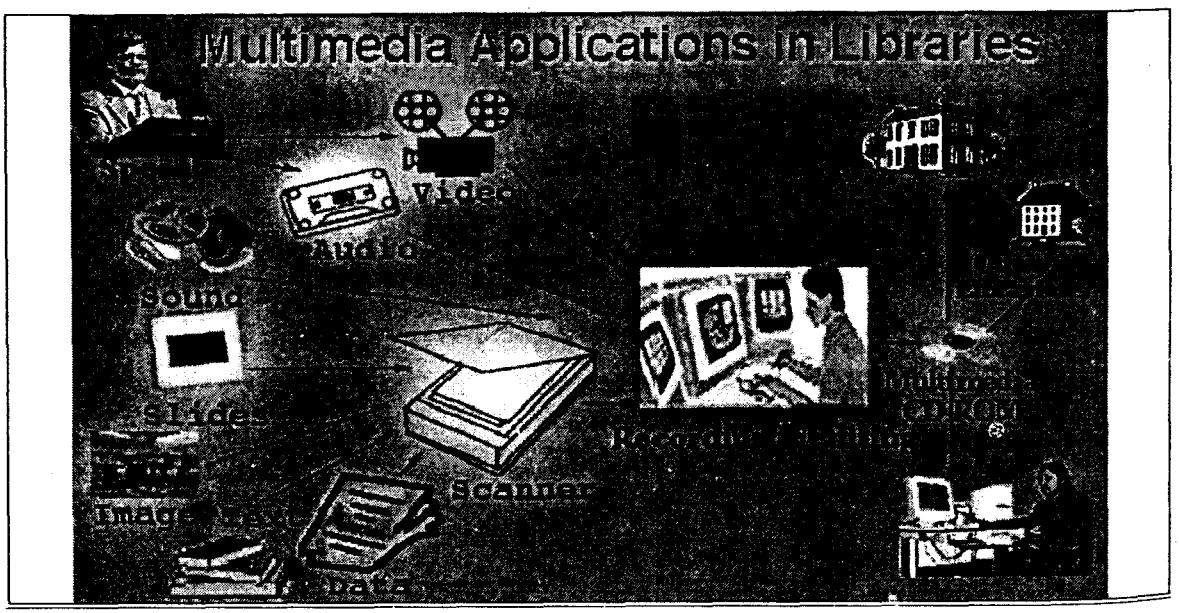
Many big libraries including the Library of Congress (LC), British Library, OCLC, etc. are building their collections in multimedia form. Apart from multimedia collection development in 1990, LC began the American Memory Project, aided by Annenberg Fund; the David and Lucile Packard Foundation; and others, for preparing multimedia CDs. This covered several kinds of information including country's historical books, pamphlets, photographs, folk songs, movies, genealogical works, etc.

LC brought out the first part of this project America at the start of a New Century 1880-1920, as a CD. Similarly, Elmer E Rasmussen Library and 'University of Alaska started a Project Jukebox—a HyperCard-based Multimedia Archival System[54]. Project Jukebox is used for archiving as well as providing access to recordings of oral history archives.

For the past five years, many libraries in the developed countries started various projects such as archiving different forms of information, multimedia databases, multimedia catalogues, walk-through programmes, Instructional packages, electronic books, and digital libraries. There are a few surveys in the literature that are focused on the usage of multimedia technology in public libraries, academic libraries and special libraries (ref. 33; ref. 40). These studies primarily cover the use of multimedia CD-ROMs in libraries and also the use of world wide web and Internet.

4.2 Indian Scenario

Now a days many librarians feels that the multimedia should be integrated into the regular services by the libraries. Even in



advanced countries, libraries do not have a separate department or personnel responsible for multimedia products or services. For the past 2-3 years, use of electronic resources, particularly multimedia, in libraries has improved considerably. However, budget for multimedia products still seems to be less, but it is growing for bigger libraries situated in metropolitan cities.

Generally, for selecting multimedia products, libraries depend on retail stores displays, publisher's catalogues, reviews, advertisements, trade shows, demos, computer magazines and catalogues. The main type of multimedia products being sought in libraries are reference and educational. Other related categories include databases (both bibliographic and full text), electronic books, software and their training packages, entertainment, leisure, etc.

Most of the libraries are using multimedia resources for reference service and instructional purpose. In this connection, a survey was undertaken by the author on the use of multimedia in Delhi libraries to have a clear picture of usage in Indian libraries particularly in Delhi. So far published results are not available in the literature. Overall, inspite of cost reduction in the multimedia hardware and software, use of the multimedia resources is limited to some of the national level institutions or organisations.

However, the majority of the libraries are now setting up such facilities for their users. After the availability of internet in a very large scale in the offices, libraries, and houses, multimedia has become more popular, with the result most of the decision makers/financial authorities are realising the importance of multimedia in the daily life and particularly in libraries. American Centre Library, British Council Libraries and a few other libraries in Delhi are having good number of multimedia PCs (MPCs) for using Internet and multimedia resources to their users.

5. TYPES OF MULTIMEDIA SYSTEMS

5.1 Multimedia Library Information Kiosks/Walk-Through Programmes

Improving accessibility to both collections and services has always been a concern of libraries. Several libraries made attempts to create plans and guides to help users. In this connection, multimedia is one of the best tools for creating electronic library guides or web library guides or electronic tours (ref. 1, 5, 6, 11, 16, 17, 23, 28, 38, 45, 59, 51) for their users. Many libraries in the US and Europe have started using hypermedia for designing library walk-through programs (a walk-through programme is an interactive multimedia database on a topic/ subject/office, etc. which virtually takes the viewer around either through interaction or automatically to provide quick reference) for their users.

Reference service is one of the most visible services that can be provided by these systems. In one study,[55] it was found that 44 per cent of reference questions were directional, 18 per cent were instructional, 32 per cent actual reference and 6 per cent were extended reference. In another study,[44] it was found that 34 per cent of the queries are actual reference and 66 per cent are directional. So, Librarians designed Hypermedia Library Information Kiosks for their users to provide quick reference and redeployed the reference staff in other library activities. Andruss Library HyperCard tour is one such hypermedia walk-through programme designed for library users to provide ready made reference. This programme does not tell the users where to find books on a specific topic, one has to still use the online or card catalogues which are briefly explained in this system, and also it is not an index to periodical or newspaper articles. However, these are described and their locations are given in this tour program.

The Andruss Library has two catalogues for library material : a card catalogue for books, phone records, tapes, maps, and music scores; and a computerised catalogue called PALS. This

tour program helps the users by giving all the basic information that the library users require to use PALS. Sweet Briar College Library's Hypermedia walk-through programme is another of this kind designed for the staff and students to provide information about the collection, catalogue, archives, services, and locations of various collections and responsible persons of various library services showing on the floor layout.

Some other important examples of multimedia library guide web library guides/ electronic tours are :

(a) Electronic Library Guide in the University of Birmingham's main library, created using ToolBook

(b) Guide to South Bank University's Centenary Library, developed with HyperCard

(c) Guide to the Dickens House Museum Library, designed using Guide

(d) Multimedia Database of Tourist Information developed using HyperCard by the Public Library of Gateshead Libraries and Arts Service

(e) Guide to the Edinburgh University Computer Services, designed using Guide

(f) Multimedia Library Tour of the Wayne State University Library (US), designed using HyperCard

(g) Multimedia Library Tour of the Sweet Briar College Library (US), designed using HyperCard

(h) Drexel Disk is a hypermedia walk-through program to the Drexel University (US) students, designed using HyperCard

(i) Multimedia Library Kiosk of the Defence Science Library, DESIDOC, designed using HyperCard.

5.2 Instruction/Training

The role of multimedia in instruction has been well documented in several research experiments done in various disciplines[52,53]. So, librarians have started using multimedia as a tool to train their staff in the new library technologies/applications and also to the users to provide training about using library resources (ref. 19, 21, 35, 47, 49). The main advantage of using multimedia for training is its interactivity, hence, it is being used by several schools, colleges, and universities for designing individualised library instructional packages for providing training to their users and also to provide in-depth subject training to their staff.

The Paul Leonard Library at San Francisco State University designed a multimedia-based instructional programme on library skills to teach their users. This package is intended to serve as a prototype for subject tutorials using computing technology. This was integrated in the library skills modules being developed by the HyperCard Library Instructional Project. University of Tennessee, Knoxville libraries have made another hypermedia-based computer-based training (CBT) package for their new staff[3]. To make this training more interesting, they have used pictures, animation, sound and graphics and implemented on Mac platform. The training programme covers library services, online catalogue, orientation to the libraries, circulation policy, access to journals literature, preservation of library materials, introduction to reference work, using e-mail, technical services, integrated online systems for libraries, and acquisition and processing library materials. A few multimedia-based CAI packages designed using HyperCard used for library staff training/instruction are:

- Iluminate—a Multimedia-based CAI project about the University of Minnesota Library's OPACs
- Tour of the Internet—a quick tour about the Internet
- Information Access—a library research skills tutorial for the university students
- HyperCard-based AACR2—a self teaching CAI package for preparing catalogue cards
- HyperCard-based University of Hawaii OPAC tutorial
- CatSkills—an interactive Multimedia package to teach AACR2. It is a good professional training tool for students, beginners in cataloguing and working librarians. This multimedia CD is available in both Mac and Windows platforms. The Library Association, London is marketing this tool for £495
- UGE 100 Library Skills—designed by the Wayne State University Library

- Teaching Mini Medline—a training tool for library users
- STAR (Student Tutorial Access & Resources)—CAI package designed for OSU Libraries
- Hypermedia-based CBT package for training the new staff of University of Tennessee, Knoxville libraries

5.3 Self Learning Tools

For people who need practical education in areas such as home ownership, vehicles repairing, etc, the multimedia CD-ROMs are a good medium for presenting the nuts-and-bolts tasks required to keep the house/machine functioning. For example, the House Repair Encyclopaedia provides a thorough compendium of well-illustrated repair guidelines, covering essential tasks such as stopping water leak, performing electrical wiring, pouring concrete, fixing a roof and patching the damaged walls and ceilings. Individual tasks are depicted in animation, sound, video and providing far better information than the static pages of a book.

The Internet Resource Guide is an online book about Internet that describes the various services available on it. Similarly many more commercial multimedia self learning tools are available in the market. Some of the important training applications available in libraries are National Geographic's Animal Samplings, ABC Golf, Music Data City, Cartoon Jukebox (an interactive colouring book for children) and Magic Flute, etc. These are self learning tools that any library can purchase and provide free education/instruction to their library users.

The linking capabilities of hypertext with multimedia provides an ideal learning environment for foreign languages. Addition of graphics, photographs, music, speech and video play a lot of impact on the learner's interest, speed of learning and retaining of information in their brain. Several popular multimedia packages were designed for learning most of the European languages by foreigners, such as Think & Talk French/Spanish/German and Introduction to Russian and Chinese, etc.

5.4 Digital/Electronic Libraries

Digital libraries are basically decentralised and easily extensible, able to support interoperability between different tools, applications and systems; support heterogeneity both in terms/forms of data and systems/tools supported; able to support a rich information seeking environment; and scaleable in terms of the size of the system (users, tools, information) (9, 15, 31, 58). Digital information may include digital books, scanned images, graphics, data, digitised A-V clips, etc. The first Digital Libraries (DL) project initiative was started in 1995 in the following Universities in USA: University of Illinois Urbana-Champaign, Carnegie-Mellon University, Stanford University, University of California at Berkeley, University of California at Santa Barbara and University of Michigan. Later on several organisations/universities/libraries in different countries started such projects.

In the UK, an important DL projects were started by British Library is ELINOR - Electronic Library Project of De Montfort University, University of East Anglia, University of Bath, University College London, University of Wales, University of Ulster and University of Surrey.

Some Digital Library related projects are listed below:

IBM Digital Library provides a hardware/software solution for the libraries to develop their own multimedia digital libraries or multimedia archival systems. It is an integrated system for capturing, indexing, storage and retrieval of tabular, textual, audio, still images, and video data at compressed and full resolutions. A search engine that can combine parametric queries, free text searches, and Query by Image Content (QBIC). Workflow processing to manage approvals and routing of data is also provided. It has an integrated rights management including electronic watermarking, encryption, licensing, accounting, metering, and authentication. It is scaleable storage and network management system that allows libraries to grow without sacrificing the convenience of anytime, anywhere access. It also provides a hierarchical storage system to protect the assets from loss

and ensure fast access to most frequently used media. A world-wide Web client that facilitates the multisearch capability and delivers ranked results. This system has an integrated frame-accurate VTR control of continuous media. IBM Digital Library provides a way for libraries and users of content to store and retrieve multimedia information along with textual information that describes it. Regardless of who the end user is, IBM Digital Library allows the users to capture information and images quickly, find them when needed, and build them into new products quickly, whether it is today's broadcast, a new multimedia CD-ROM, magazine, or Internet product.

Some other important Digital Library Initiative projects and their site information

(a) The Networked Computer Science Technical Reports Library (Cornell University, Department of Computer Science)—a collection of computer science technical reports from CS departments and industrial and government research laboratories.

(b) The Networked Digital Library of Theses and Dissertations—a project which aims to increase the availability of theses and dissertations by placing them online with the content in an accessible form. The works may be accessed through the Electronic Thesis and Dissertation Library.

(c) Library Without Walls (The Los Alamos National Laboratory)—a broad based digital library project to make information available to researchers on their desktops on a network environment.

(d) Thesaurus Linguarum Hiberni (Royal Irish Academy & University College Cork)—an interactive on-line searcheable database archive of literary and historical materials in the various languages of early, mediaeval and modern Ireland.

(e) The Perseus Project (Tufts University)—a collection on ancient Greek and Roman world. Perseus contains texts in Greek and its translation.

(f) The RYHINER (University Library of Berne) — consists of more than 15,000 maps, charts, plans and views from the 16th to the 18th century, covering the whole globe.

(g) Project Bartleby (Columbia University)—a public library on the Internet.

(h) Digital Libraries (Xerox)—a collection papers discussing digital libraries and their research efforts.

(i) The Visible Human Project (NLM)—a complete, anatomically detailed, three-dimensional representations of the male and female human body.

(j) National Digital Library (Library of Congress) the American Memory project, Special American Collections at the LC and Country Studies.

(k) Digital Library Programme at Tilburg University is to provide staff and students with excellent support facilities for teaching, learning and research.

National Library of Canada Electronic Collection
http://www.nlc-bnc.ca/eppp/e-coll-e.h.

International Institute for Electronic Library Research
http://ford.mk.dmu.ac.uk.

Elite Project
http://cosimo.ing.unifi.it/research/elitinfo.html.

Carnegie Mellon University - Full-content search and retrieval of video
http://fuzine.mt.cs.cmu.edu/im/imformedia.ht

Stanford University - Interoperation mechanisms among heterogeneous services
http://Warrus.Stanford.EDU/diglib/

University of California at Berkeley - Work-centered digital information services
http://elib.cs.berkeley.edu

University of California at Santa Barbara - Spatially-referenced map information
http://alexandria.sdc.ucsb.edu/

University of Illlinois at Urbana-Champaign—Federating repositories of scientific literature
http://www.grainer.uiuc.edu/dli

University of Michigan Intelligent agents for information location
http://http2.sils.umich.edu/UMDL/HomePage.html

5.5 Multimedia Databases

Now-a-days a large number of photographs, artifacts, audio recordings and textual material in various collections are available in libraries. Multimedia is helping the librarians in integrating all the information from various forms/sources subject-wise and making meaningful multimedia databases both for day-to-day use and archiving.

Mendocino County Library, Ukiah has developed a multimedia database of historical and cultural information that is relevant to the Californian Indians in that area. In addition to the historical photographs, this database is also having parts of oral histories from the state and local archives. Ultimately this library is trying to bring out a CD-ROM on 'Gathering together a Native American History'.

Ancient Biblical Manuscript Centre in Claremont, California has ancient texts, photographs, negatives, related to the Bible. This centre has undertaken an ambitious programme 'Dead Sea Scroll Imaging Project' (Zuckman, 1993), which involves digitising and reformatting photographic negatives for the past four years. The Centre has converted this collection into a comprehensive digital library and it has sophisticated search/sort inquiries on Dead Sea Scrolls.

5.6 Multimedia Information Retrieval System

Hypermedia Information Retrieval System (HIRS) is a hypertext version of a large and comprehensive annotated bibliography of hypertext/hypermedia information. Compiled from a variety of sources including periodicals, academic journals and online informational databases, it is intended for educational and training purposes only and no warranty is made as to the suitability of anything included in this stack for any specific purpose. HIRS was created in association with Project Rivendell, at the University of Toledo (Ohio). Rivendell focuses on the application of hypertext/hypermedia research to address training and educational needs. It is an interdisciplinary centre for applied hypermedia research serving as the focal point for the collection, synthesis, evaluation, and dissemination of the most current research available for using hypermedia to solve instructional problems in a variety of learning settings. HyperKRS is another commercial package being used for developing hypermedia-based information retrieval systems.

5.7 Multimedia Catalogues

Interactive multimedia Catalogues are electronic forms of catalogues distributed in the mail-order catalogue market. Printed catalogues are one of the important information sources particularly in technical libraries. These catalogues consume large percentage of postal carrier bags. Today, the interactive multimedia catalogues offer a high volume of information on a small disk. Several international publishing companies are also bringing out their catalogues in interactive multimedia CD-ROMs. For example, CD-ROM Catalogue Shopping, SW Catalogues, Macromedia Showcase, SilverPlatter Directory of Electronic Resources, etc.

Under the Colorado Alliance of Research Libraries (CARL) System, Denver Public Library has designed a Kid's Catalogue is for children. The Kid's Catalogue designed to capture the imagination and the natural curiosity of children and connect them with intellectual and emotional delights of information. This catalogue was designed in graphical user interface (GUI) using HyperCard software. It was found that this catalogue made a considerable impact on the children's usage of the library collection.

The Hans Helgesen Elementary School Library, British Columbia, Canada have also developed a HyperCard-based school card catalogue for the school children. HyperCataloguer is a HyperCard-based cataloguing tool. It can take text, graphics, animation, audio and video information for preparing multimedia-based digital catalogues. Several libraries are using multimedia catalogues[8, 46] and OPACs[4] in their libraries for various purposes.

5.8 Multimedia Information Resources

The kinds of multimedia systems/ information resorces available in libraries and information centres include: i) CD-ROMs; ii) video discs (VD); iii) laser discs (LD); iv) audio & video cassettes; v) web; vi) databases on servers; and vii) digital video.

Many big publishers have now converted their reference books including, encyclopaedias, dictionaries, handbooks, etc from the traditional print form to multimedia format[18]. Thus libraries have a choice of selecting either print or multimedia publications. Some of the multimedia publications are listed below :

Encyclopaedias: Crompton's Interactive Encyclopaedia, 1998; Britannica CD 98 and Britannica Video CD; Encyclopaedia Americana 98; Grolier Multimedia Encyclopaedia, 1998; World Book Multimedia Encyclopaedia; Microsoft Encarta 98, etc.

Dictionaries and Directories: Oxford English Dictionary; Webster English Dictionary; The Dictionary of Living World; National Geograpic's Mammals; British Birds; Microsoft Dinosaurs, etc.

Reference Manuals: MIT Movie Manual; Interactive Graphics Documents; The Manual of Medical Therapeutics, etc.

Year Books: The Guiness Disk of Records

Reference Books: Earth Quest; World Climate Disc; Interactive Periodic Table, etc.

Electronic Books: Manual of Medical Therapeutics; The Electronic Whole Earth Catalogue; Microsoft Musical Instruments; Introduction to Classical Music; The Oxford Textbook of Medicine on CD-ROM, etc.

Electronic Newspapers/Journals: The Times/ Sunday Times/The Guardian (21 Indian newspapers are available on Internet); Times, Newsweek (37 Indian popular magazines are available on Internet); Multimedia Tech for Electronic Newspapers; Integrated Multimedia Environment; Music & Multimedia Publishing; ST & Medical Publishing for Electronic Delivery, etc.

Multimedia Fiction: Nowadays several Multimedia fiction books/packages are available for all levels of people. For example, The Manhole, a children fiction takes the kids to a fantasy world with talking animals and dragons where magic bean stalks grow into the sky.

5.9 Geographical Information Systems(GIS)

Additional multimedia information, visuals, audio and video can be associated along with landmarks and other points of interest in a Geographical Information Systems[32]. For example, GIS multimedia application in The National Capital Planning Commission (NCPC), Washington, DC, uses online video clips and images of buildings along with their maps. In India, Bangalore Online, is a multimedia GIS applications designed with MapInfo software. Similarly Escorts, India developed multimedia GIS for several cities in India. Number of commercial GIS reference tools are available in the market for libraries for their ready reference. These tools include: Quick Reference Atlas (Rand McNally New Media; PC Globe Maps'n' Facts; 3D Atlas; and World Atlas MPC.

5.10 Electronic Publishing

The emergence of CD-writers and recordable CDs hassolved some of the problems of the libraries in storing/archiving their less used materials. Multimedia tools along with CD-writers made possible in publishing information from different sources in a most easy to use and acceptable form to the library users. Now several big libraries started publishing their special collections, image databases, OPACs, etc on multimedia CD-ROMs. It is one of the most viable alternatives to paper-based publishing.

5.11 Multimedia Archival System

Multimedia Archival System are mostly developed by the national museums, publishing houses, movie production companies, etc[39]. The Design Museum located in Butler's Wharf in London has stored information regarding 250 artifacts, 40 designers, 25 manufactures and 11

monuments on Mac using HyperCard. The museum of London has over 3 million archaeological files on 7 gigabite storage space. Similarly ABC News has a very large size Mac-based video archival library for developing hypermedia applications. Project Jukebox is another HyperCard-based multimedia archival system (Elmer E. Rasmussen Library, University of Alaska, Fairbanks) for archiving multimedia information resources in the library.

5.12 Multimedia Use in Museum Libraries

Multimedia systems allow images, sounds and text to be combined in imaginative new ways to be transmitted in digitised formats and to be stored and reproduced or networked for wide public access and use. To accelerate the multimedia digitalisation of collections, to ensure their accessibility to the public and to stress its value as a learning resource for schools and universities. Global co-operation will help museums and galleries to increase public interest in their collections and to exploit their resources for the benefit of further enrichment. The target users will be students, teachers, researchers, general public as well as curators and the end-users of the multimedia services provided by museums and galleries. Many American, European and Indian libraries are already using Multimedia in their libraries for providing information services to their users[10, 30, 41, 42] and interactive museums displays[29, 45]

Examples of Indian multimedia museum guides are :

- an interactive Multimedia guide of the National Museum of Natural History designed using Director
- an interactive Multimedia guide of the National Rail Museum designed using ToolBook.

5.13 Call Number Directories

A Call Number Directory program was designed using Macintosh's HyperCard at the Science and Engineering Library. The Science and Engineering Library houses materials pertaining to the life and physical sciences, computing, mathematics, and nursing on seven floors. This programme helps the users in locating the information and also the physical locations of the books in different floors showing the pictures of those floors, stacks, etc.

6. LIMITATIONS OF MULTIMEDIA

Even though Multimedia systems have many advantages introducing such systems into offices, schools, colleges, universities, and homes is not easy task. The problems or limitations of multimedia technology are in two areas :

6.1 Technology

(a) The requisite hardware/software to setup a multimedia content creating facility is still very expensive and requires large investments.

(b) A wide range of multimedia software is not available to integrate, control, coordinate, manage and adapt different media for the latest human computer interfaces.

(c) There is a lack of support software facilitating the authoring, composition and production of multimedia content.

(d) Poor support technology in the area of multimedia data and document storage and manipulation.

(e) Lack of proper search and pattern recognition capability for locating information from multimedia databases.

(f) Lack of software support technology for group decision making and cooperative work, especially in application of multimedia technology to cooperative decision making and work.

(g) Converting all the multimedia resources into digital multimedia and storing is difficult (storage technology limitations).

(h) Time being, there is no full-fledged established hardware/software multimedia technology solution for design and development of a large size realtime multimedia digital library.

(i) Existing distributed networks do not support real time multimedia services.

6.2 Skilled Manpower

(i) Lack of trained manpower for the development and management of multimedia databases

(ii) Vast amount of work (i.e., 100 to 800 person hours) required to create an hour interactive multimedia content

(iii) Good multimedia content creation requires multi-disciplinary disciplinary knowledge, multi-technological skills and experience.

The main barrier to the widespread use of multimedia technology is the absence of standardisation among the various platforms and between hardware and software. For the time being there is no full-strength application of the multimedia information system, however, several universities are working in exploiting the full strengths of multimedia, such as natural language processing, realtime A-V content retrieval along with text and date, and implementing such a system in a network environment.

The market is dominated by multimedia CD-ROMs, multimedia databases, reference tools, etc. The effectiveness of these systems will depend on various factors such as well developed software programs, information content and development of new information handling skills. The requirements of the effective management are the support of the senior manager, the professional qualifications, knowledge about IT technology, interpersonal skills and learning models and frameworks and how to use these new resources and to be effective in the information needs of an organisation.

7. MULTIMEDIA TRENDS IN LIBRARY & INFORMATION SERVICES

After the introduction of e-mail and Internet in libraries, use of information in digital form has increased manyfolds. There is a considerable change in libraries in their acquisition of library collection, organisation and providing services to users. The prospects for the development of a multimedia market have been transformed in the past two years by the explosive emergence of the Internet and the digital revolution in the converging IT, telecoms and entertainment sectors. There will be major changes in distribution networks and the implications of multimedia on the economy will be profound. The Internet has shown that there is a huge market for multimedia applications.

The most exciting developments will come from what is known as networked multimedia-the distribution of information using both telecommunication and broadcast technologies. It is currently multimedia packages/products such as CD-ROMs and hand-held videogames-which are the favoured methods of distributing multimedia, mainly because communications networks cannot deliver the same level of functionality. However networks are rapidly being upgraded to distribute graphics, sound and video and should soon take over from packaged multimedia.

Products which can be transmitted digitally such as CDs and books are already facing major challenges. Paper publishing may never be completely replaced by electronic distribution but the cost savings for content producers may be too large to ignore. Value in the multimedia market will move away from infrastructure provision, where the network operators are strong, towards service provision and packaging which require innovation and new skills for libraries and information services[14, 37, 50]

Consequently, new types of companies are poised to wrench control of the multimedia market from the network operators who will have to act quickly to gain the skills necessary to compete in the higher value areas of the market. Their alternative is to be left with high volume, but low profitability infrastructure provision.

8. CONCLUSION

Now many inexpensive hypermedia software are available in the market for Macs and PCs. The cost of both the hardware and software are also going down considerably. However, in India, introduction of computers and latest technologies such as multimedia, CD-ROMs, etc. is limited to the big and

affluent libraries in the metropolitan cities only. It may be due to the unawareness of these technologies, insufficient funds, lack of skilled manpower, etc. Unless all the Indian Library Schools introduce the latest technologies in their syllabi and the teachers get trained, it will not be possible to change the present scenario of the libraries.

Multimedia is a boon to the libraries, it is up to the Indian librarians how they use it in their libraries to improve the services. DESIDOC has designed a Multimedia Library Information Kiosk for its user. Similarly others can also start designing for their libraries. Since it is proven technology, it is up to Indian librarians/libraries to implement these technologies in their libraries and make optimum use to improve the user services as early as possible.

In this information technology society, the future users require to access a variety of multimedia information sources in a manner that is simple, easy, and independent of time, place and subject discipline, for the purpose ranging from augmenting and refreshing memory, to learning, decision-making, and creating or uncovering new knowledge. The time is not too far in this cyberworld and all these dreams will be realities in the coming 21st century.

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