

## **DIGITIZING THE ACADEMIC LIBRARIES IN INDIA - NEED OF THE HOUR**

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### **Abstract**

Due to information revolution, digital libraries are developing all over the world to collect, store and communicate the information through electronic media. Digital technologies have revolutionized the information management activities in the academic libraries during the past few years developing the digital academic libraries. In the present age of information revolution and ever increasing demand for exact and consolidated information, the functions and old methods followed by traditional libraries are being replaced by new techniques and technologies. This paper discusses the various aspects of the conversion of in-house academic library material into electronic format, which leads to creation of digital academic library. Also the objectives of digitization have been correlated with the mission of the academic libraries.

**Keywords:** Digital Academic Library (DAL)/ Digitization Project/ Institutional Repositories (IR)/ Digital Library/ Retrospective Conversion (RECON)

### **1. Introduction**

Digital technology is not something, you can postpone for the future. It is something; you design for the present keeping in view the future. Today, digital technologies are bringing revolutionary changes in the way the information is stored, retrieved and disseminated. These have profound impact on the ways academic libraries function and opened up electronic access to information, for million of users. Academic scenario, over the years, has undergone a tremendous change assuming new dimensions influenced by the technology driven applications. Instead of a building that holds books, the library is now evolving into an electronic portal to a growing global collection of digital content. Academic libraries are facing two major threats: a global digital environment and increasing competition. So, they must improve the quality of their services in order to survive. The emerging demand for the digital resources may warrant the restructuring of the academic libraries to digital academic libraries. The doors to this virtual library are open 24 hours a day, seven days a week, and the library's holding came to the user when needed. Digital libraries are developing all over the world to collect, store and communicate the information through electronic media. Compared to the different developed countries, there is slow development of digital libraries in India. Digitization started with the introduction of computers in library activities in

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1980s in India but it was limited to creation of bibliographic database and house keeping operations. This conversion of bibliographic catalogue record into digital format was the initial stage, but now it has been broadened by implementing it to conversion of full text, graphics, sounds, video- recordings etc, thus giving birth to digital libraries.

## **2. What is a Digital Academic Library (DAL)?**

In the 21st century, the word library does not give us a view of a storehouse of books, journals and other forms of library materials. As information professionals, librarians are concerned with staying ahead of the technology curve. Whenever a new information technology emerges, librarians invariably appropriate it and adopt it to the library setting. Information and research resources are becoming more varied, most obviously as electronic products-materials converted from analog to digital formats and also materials that were 'born digital'-become ever more pervasive. Also, there have been no slow down in the production of traditional books and journals that might offset this explosion of new resources. So the motive of the digital academic libraries should be to provide new services and extend exiting ones so as to have successful integration of the traditional and digital formats. Digital Academic Library (DAL) is not an alternative but real value-addition for traditional library services. Basically, digital academic library is not the World Wide Web or online databases and often sought of online search services, but a full-fledged library facility. The only difference between a traditional academic library and digital academic library is that it provides library materials in a digital format as well as paper-based format. The digital library service has not replaced libraries of printed materials, but has enhanced information access and use by exploring information and communication technologies [1].

A digital academic library is a library consisting of e-resources and services, supported by specialized staff, with an objective to select, structure, distribute and preserve the collection of digital works to support the interest of a defined community of users. DAL is more flexible than conventional library as it is portable, largely accessible, integrated with National and International sources of information. The programs of the DAL should support information access and delivery via electronic communication; information preservation; storage and retrieval; information management; consultation and training; new forms of scholarly and scientific communication; and development of the knowledge network of the university [2]. DAL is a system providing a community of users with coherent access to large, organized repository of information and knowledge. The digital academic library is not just one entity, but multiple sources seamlessly integrated.

## **3. Major Characteristics of DAL Collection**

The DAL vision is for single, continuously available, interoperable platform having following parts:

- a. Offline Part: - Preparing a document collection for presentation.
  - b. Online Part: - Presenting the collection to the user through an appropriate Interface.
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Major characteristics of DAL Collection are the information is available in digital form, organized on computers and available over a network having following collections:

1. A variety of intangible objects
  - From outside : e-publications, e-journals, e-books, multimedia i.e. objects born digital
  - From inside: objects, collections, databases created within library.
2. A variety of tangible objects selected from traditional collections and then digitized and organized.

#### **4. Why Digital Academic Library (DAL)?**

Changes in the nature of information, in research strategies, and in the structure of education are affecting both academic institutions and their libraries. Digital technology is having a profound impact on organizational structures, procedures and products of academic libraries.

1. Conventional libraries are expensive. They occupy expensive buildings on prime sites. Big libraries employ hundreds of people well-educated.
2. Librarians never have enough money to acquire and process all the materials they desire. Publishing is also very expensive. Printing may be replaced by electronic information, because it is technically, economically and legally feasible.
3. Academic libraries have traditionally acquired books and serials as the building blocks for self-sufficient local collections. The changing nature and quality of scholarly resources now at hand force them to confront new kinds of material.
4. It is ever more difficult for libraries to anticipate and address their users' needs because of the proliferation of the information sources.
5. Finally, research is becoming more esoteric and as scholars demand ever more and more varied information. Academic libraries must adjust to both trends by adopting digitization projects.

#### **5. Advantages of Digital Academic Libraries**

Digital Academic libraries can immediately adopt innovations in technology providing users with improvements in electronic and audio book technology as well as presenting new forms of communication along with following advantages [3]:

- **No physical boundary.** The user of a digital academic library need not to go to the library physically; user from all over the world can gain access to the same information, as long as an Internet connection is available.
  - **Round the clock availability.** A major advantage of digital libraries is that user can gain access to the information at any time, night or day.
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- **Multiple accesses.** The same resources can be used at the same time by a number of users.
  - **Structured approach.** Digital libraries provide access to much richer content in a more structured manner, i.e. we can easily move from the catalog to the particular book then to a particular chapter and so on.
  - **Information retrieval.** The user is able to use any search term belonging to the word or phrase of the entire collection. Digital libraries can provide very user-friendly interfaces, giving clickable access to its resources.
  - **Preservation and conservation.** An exact copy of the original can be made any number of times without any degradation in quality.
  - **Space.** Whereas traditional libraries are limited by storage space, digital libraries have the potential to store much more information, simply because digital information requires very little physical space to contain them. When a library has no space for extension digitization is the only solution.
  - **Networking.** A particular digital library can provide a link to any other resources of other digital libraries very easily; thus a seamlessly integrated resource sharing can be achieved.
  - **Quality.** Can enhance images electronically, so that they can be viewed with greater legibility.
  - **Access.** It provides faster access to the holdings of libraries worldwide through automated catalogues and helps to locate both physical and digitized versions of scholarly articles and books through single interface.
  - **Search.** Users can find what they are looking for quickly and independently. Optimizes searches, enable to simultaneously search the internet, commercial databases, and library collections. Facilitates to save search results and conduct additional processing to narrow on quality results and helps to access the digitized content or locate additional items of interest.
  - **Service.** DAL provide better delivery of information than was possible in traditional academic libraries in the past. A professional or scholar is better served by sitting at the personal computer connected to a communications network than by making a visit to a library. In fact, DAL brings library to the user.

## 6. Downside of Digitization of Academic Libraries

Despite everything that digitization can accomplish, there are some very good reason to give this whole project a second thought, especially in Indian scenario.

Firstly, not every collection is worth digitizing. Successful digital projects are the result of careful evaluation of collections, and the digitization of only those items that will provide the greatest benefit to the user. Secondly, digital projects are very expensive. At this point no institution has managed to make digitization cost effective [4]. Digitization is a costly affair and also it is an additional cost for the libraries to bear

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amidst budget cuts and decreased staffing. Moreover, cost of digitization continues even after a project's conclusion, as all digital files require maintenance to ensure that they will be readable in the future. Also digitization does not replace the need to perform all the traditional tasks like acquiring, organizing, cataloguing and preserving materials, but it results in increased expectations of the user needs.

## **7. Planning for Digital Academic Library (DAL)**

Thus, building digital lib is a Herculean task, which requires new models of digital technology and trained library professionals. There are technologies available, but use of the appropriate ones, is the key [5]. While conceptualizing any digitization project, it is important to have some measurement criteria for outputs as well as outcomes. Outputs should be in terms of number of documents digitized; outcomes should be in terms of ease of accessibility; the speed or the reach, and the ability to access information and knowledge. It is not possible for any academic library particularly in developing country like India, to digitize the whole collection in a single phase. The academic libraries having large collections are facing problems to convert their printed material into digital. Huge funds and time will be required for such projects. So, initially the process of digitization of academic libraries should be done in phased manner. Firstly, it should be started with old & rare documents, theses and dissertations, faculty publications, history of institution, courses and training programs of the institution, thus creating an Institutional Repository (IR) [6].

An Institutional Repository is a database, with a set of services to capture, store, index, preserve and redistributing an institution's scholarly research in digital format. It consists of formally organized and managed collection of digital content generated by faculty, staff and students at an institution or university. Various software packages are available to build an IR like CDSware, Dspace, Eprints, Fedora, Greenstone etc. to name a few. These software are available free of cost and academic institutes of developed countries are already reaping the rich benefits of IRs. It is high time that Indian Universities should also take a decision and make strong commitment to develop IRs and convince the faculty members and research scholars to deposit papers in the digital archive. To reveal the prestige of an academic institution, IR is the one and only way to make the whole world knowing the esteem of a university. With access to IR, the students will be able to find, read the literature, reviews of their peers and global knowledge sharing is also possible.

After this, the library should get electronic books, journals and online databases, which would lead to the foundation of the digital library. Various kinds of learning objects in digital format will also facilitate IT enabled pedagogy in the repositories of academic institutions. Now, the process of retrospective digitization of library documents will be considered, which is a highly specialized task and needs expensive equipments. In addition, it requires manpower having professional talent in digitization. Conversion of such existing materials/records into digital format may be recognized as 'Retrospective Conversion' (RECON) [7]. RECON should also be done in phased manner taking into consideration the time and cost required to create digital records.

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## 8. Digitization of Collection

Digitization is the conversion of materials or analog media into electronic form for creating digital collection. Analog media includes books, journals articles, micro form, photos, audio, video etc. Simply it is high speed data transmission technique. Digitization is the process by which analog content is converted into a sequence of 1s and 0s and put into a binary code to be readable by a computer. Digital information also has common characteristics and qualities regardless of whether the content is stored on DVD, CD-Rom or other digital storage media; it can be linked to other materials to create multimedia; it is not dependent upon spatial or temporal barriers or hierarchies; it can be stored and delivered in a variety of ways. Digitization is necessitated both accessibility and preservation. By creating and building the digital information, we will be leading towards digital library. Digital collection is a most important component of the digital academic library. A digital library is not a single entity, although it may have digital contents created in-house or acquired from outside in digital format and loaded on network.

In general, digitization denotes “converting a document from non-digital medium into digital medium for information storage and retrieval.” In a digital library, the user computer, copies document but the original document remains in the computer, whereas in traditional library system, document if loaned is physically removed from the shelf. Digital library is searchable and browse able from any corner of the world. The process of digitization involves two major sets of activities [8]

1. The process of digital conversion where by the source material are converted into digital form, and,
2. The processing of digitized information, which involves several activities related to the storage, organization, processing and retrieval of digitized information.

## 9. Important Aspects to Keep in Mind while Digitizing

Digital technology offers distinctive advantages to academic institutions with impressive collection of scholarly resources. But as this is a new skill and a recent addition to the expertise of the librarians, a careful scheduling of the digitization project is considered necessary, keeping in view the following important aspects:

1. End users and their needs: The present and future requirements of target groups of users, who are going to use this collection, are to be kept in mind. Their requisites are to be analyzed and selected what is technologically and economically feasible for the academic library.
  2. Collection development: Kinds of resources to be included, keeping in view the subject area of institution. Also some information resources found in the traditional libraries are to be reproduced. Almost anything found on the Internet can be considered for inclusion, but one has to be selective.
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3. Content: Quality, accuracy, completeness and authority of the content must be given due consideration.
4. System and application software: Within limited budgets, software that facilitates the organization, searching, display and maintenance of the digital objects must be opted for. Some indispensable software packages required for digitization project are Image processing/editing software, File Compression Software, Optical Character Recognition (OCR) software. Also the software should be capable of implementing relevant standards and to allow easily import and export of the data.
5. Hardware: Standard computing hardware is required to meet the most of the activities. Due attention needs to be paid to the purchase of scanners, digital cameras, audio-visual aids and other digitization tools.
6. Technical Aspect: Need of indexes for organization of the material. Must include metadata of metadata, including catalogs of catalogs and libraries of libraries.
7. Search Options: More content-need for powerful search systems and user-friendly structuring.
8. User interface: For web-based collections navigation is to be made effective and attractive by using hyperlinks, frames, keywords, indexes.
9. User Education Series: Lastly, it is must to educate the user through well planned user education series. Diverse kind of marketing and promotional strategies are to be adopted.

## **10. Digitization Project**

The success of DAL project hinges not on expensive technology, but rather on sound project planning. Perhaps because digitization is relatively new, institution too often concentrate on technological aspects before deciding on a project's goal. Technology should never derive digital projects, goals should be determined first, and only then should the appropriate technology be selected in order to meet a project's objectives. The process of digitization includes all those steps since the selection of the material and their appropriate management for a wider group. Some of the important steps, for successful implementation of digitization project, are as follows:

1. Selection Policy: Selection of documents and copyright issue are the basic steps to be followed in the planning stage. It should be decided that which document should be taken first before digitization begins. Investigations should be made whether the document to be digitized is already available in digital or other versions. It is essential to determine copyright and other legal restrictions. In policy regarding transfer of copyright since, with out it digitization is not feasible, academic library has to decide what is to be digitized and what can be preserved on other media restricted to the availability of budget. Such items are to be eliminated, which are in poor condition or having incomplete information.
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2. Conversion: It is very important to determine imaging requirements like assessing document attributes to determine scanning requirements (resolution, bit depth, enhancements, file format, compression). After choosing one of the digital image conversion methods, as suited to a particular academic library, the process of digitization starts. The digital Image is an “electronic photograph” mapped as a set of picture elements (pixels) and arrange according to a predefined ratio of columns and rows. The basic purpose behind this conversion is to produce analog representations for on-screen display or printing. After the scanning is done, it is very essential to create documentation for bibliographic controls i.e. create catalogue entries for digital resources.
3. Quality Control Aspect: Quality Assurance must be performed on all master images and their derivatives with each step being fully documented. Performance of on-screen and paper inspection are essential to ascertain quality. A number of automated evaluation tools are available these days but visual quality evaluation is more appropriate tool. Accuracy and consistency of file naming, structuring, text conversion and encoding must be maintained.
4. Collection Management: The possibility of being able to use a collection of digital images in the way it was intended depends not only on conversion standards and quality control, but also on how efficiently the collection is managed. The purpose is not only to meet the short term needs but to provide accessibility over time.

Last, but not the least entity to be kept in mind that resource is the key factor in running a digitization project successfully.

## **11 Conclusion**

The complexion of academic libraries is changing and a facelift is provided in the light of digital technologies. It not only facilitates the library functions but also saves the precious time, strength and energy of users. Academic institutions are currently undergoing the process by which one medium is reformed and improved upon by another. The trend is towards digitizing traditional resources to e-resources, whereby providing a value addition to the existing traditional library services. Realizing this digital revolution, the time is ripe for the academic libraries to built digital academic libraries and set an exemplary for others to follow. World-wide academic libraries are implementing digital technologies to provide their users with electronic access to a variety of information resources. But, for digitization to succeed in developing countries like India, the fiscal environment of academic libraries have to be premeditated while choosing the correct approach or a road map to a digital library. Today digital libraries are expensive, initially more expensive. However, digital libraries are made from components that are declining rapidly in price. As the cost of the underlying technology continues to fall, DAL will become steadily less expensive and all-pervading.

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