



MANAGEMENT ISSUES FOR DIGITIZATION OF KNOWLEDGE RESOURCES

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INTRODUCTION

The global information infrastructure is transforming with the growth in full-text digital resources and fast communication facilities. This is so because institutions, agencies and departments in every country are busy capturing, processing, storing and disseminating information in the digital form. It is well established that fast access to desired information can lead to rapid developed of a country, an institution or an individual. While there are controls on this growing information resource, it has global implications and applications and therefore digitization is not a local affair as long as we understand that we can contribute to global information resources and also access its resources for any purpose.

From giving bibliographic and catalogue services in digital form to the users, the libraries are slowly creating full-text digital data with multimedia applications. These applications have already begun to revolutionize methods of research and access to education material. It will further transform life and cultural patterns the world over. The knowledge resources including books, journals, manuscripts, etc. available in libraries, archives, museums and private collections are getting identified through library and information networks and access to them has already made success stories around the world. It is now the turn of full-text multimedia –based digital resources that are becoming essential these days.

KNOWLEDGE RESOURCES

Promoting Infrastructure and Competencies

India holds in its libraries, archives, museums, private collections books stores and information centers millions of books, journals, manuscripts, reports, grey

literature, CD-ROMs video-recordings, sound-recordings, including objects of art and historical and archaeological evidence. The contributions made by Indian scholars for more than the last few millennia lie scattered in such repositories of documents. Several management issues come to mind in this regard. They are given as follows:

Cooperation at the National Level

It is important to promote interest in the digitization of documents among commercial agencies through competitiveness, cooperation methods and the relevance of partnerships for a reasonably profitable business. In order to achieve this result well, it is necessary to create a system for resolving copyright issues.

Scope of Content

The scope of content at the national level needs to be drawn to the attention of the commercial sector so that they take immediate interest in the job. For instance, the digitization work in the public sector including government organizations is much too large and this needs to be undertaken quickly. To achieve this objective, experiments will have to be made at the national level to promote cooperation and avoid duplication in this work. The central government and state governments could fund foundations to undertake this massive job and develop infrastructure for cooperation with the agencies like publishers that create content in the print form. The whole process demands the creation of a new financing policy so that there are incentives for developing this nation resource.

Training

Training at state and national levels will have to be arranged to implement the processes of content creation and achieve a higher degree of competency in content creation.



Types of Projects to be Undertaken

Content creation works in digital form needs to be done by each institution, ministry or department in the country. For instance, courseware needs to be made available by institutions such as the University Grants Commission and made available through the Internet to students. Since integrated access to knowledge is needed on any subject there is a need to coordinate content creation processes. This will result in a variety of digital learning resources for the users.

In the field of education special attention will have to be given to upgrading the skill of teachers in accessing digital resources, use of digital television, and to the general public in using knowledge in the digital form. This means training on a much larger scale will have to be introduced by private and government agencies, associations and NGOs.

Standards

Efforts will have to be made to introduce standards for Meta information and data security which is at par with global standards.

Communication Facilities

Broadband connectivity at all levels in the country needs to be established to enable data for images and video-conferencing to move fast. This will lead to distribution of varied content and the promotion of electronic transactions and commerce.

This general telecommunication framework and the compulsions for using electronic commerce and full-text digital resources will have international implications. Education and research activities will receive a boost and the public will begin to appreciate the importance of digitization at the national and international levels.

Management of Digitization Processes

Management of digitations' processes would include all kinds of documents. Owing to lack of space, we are referring only to the management issues concerning printed documents.

The committees

The committees of experts for technical purposes as well as for the selection of documents should be constituted to undertake the selection process.

Selection of Materials for Scanning

The Principles

The purpose of selecting documents for scanning should be based on the following principles:

a. Digital Document on the Web is a Published Document.

A document that is digitized and made available to the users in the world is open for use and comment by any scholar, professional and the general public. It is important to see that whatever has been

digitized is a unique publication and it carries with it all the characteristics of a published document.

b. Own Copyright of the Document before digitizing it.

In order to execute the right of a publisher without violating copyright, It is important for every institution digitizing a document to own copyright of each document to be digitized.

c. Arrange Financial Resources to Support Preservation of Digital Databases

Digital databases need to be accommodated in new formats and hardware using compatible software from time to time. The financial support will have to be arranged to support the change over so that the users do not start having no access to the document. It is therefore important that the project should have the means of revenue generation or the facility of getting a regular grant for the maintenance of the digital data.

d. To Reduce Costs on Scanning Select the Best

The initial costs on scanning may not be much but coupled with quality

e. For Each Document Create a Well-Researched Documentation control checks, preparation of indexes catalogues and metadata the entire job becomes expensive. It is therefore advisable to select the best documents at the initial stage.

Before scanning is started each document, part by part, should be processed for appropriate captions and completeness of the document. Accompanying material needs to be written to give the necessary context to the document being digitized.

f. Don't Publish Sensitive Documents on the Web without Consulting the Concerned Officials or Organizations. Each institution has to keep in mind that any sensitive document for a group, society or country should not be digitized unless it is in the interest of the country that such information should reach a wider audience.

g. Undertake a Final Overall Quality Check

The Committee for Selecting Documents for Scanning should undertake a final quality check in terms of the authenticity and accuracy of information both for textual or visual materials and the overall presentation of the digital data on the Web.

It has to be kept in mind that the documents to be digitized conform to broader objectives of the institution. Therefore the document should be in perfect condition. If it is not, another copy of the document should be arranged for digitization purpose. Such documents which are tiny/oversize, where the physical condition is bad, or the documents are available on a format like glass or birch bark special techniques need to be used.



Basic Selection Methods

For selecting documents for digitization the following three steps need to be taken into account.

A Nomination; A meeting of experts, author's library and information scientists, archivists, etc. should be held to collect names of documents that need to be selected for digitization purposes. While doing so the following guidelines need to be seriously considered:

- a. How much of the collection is well and accurately documented at the item level in reliable and complete indices and finding aids, and where are these well documented items?
- b. How much of the collection is in stable or good condition, and where are these stable materials?
- c. What portion of the collection is standard and consistently sized, normal contrast, black-and-white and/or printed materials, and where do these materials fall? Note; a void oversized, unusual and varying format, long-tonal range, color and handwritten materials for start-up projects.
- d. What materials are easy to provide to researchers because of their size, format, or viewing requirement and where are they in the collection?
- e. What percentage of the materials does the institution have the copyrights to or licenses for, and where are the public domain materials?
- f. What percentage of the materials has no restrictions or sensitivities of any sort (such as privacy, publicity, defamation, obscenity and sensitivity, or donor restrictions), and where is this restricted and non-sensitive material?
- g. What materials are of highest monetary value and well secured, and where are they in the collections?
- h. What materials are judged to be at highest risk and why, and where are they located in the collections? Of these, which are stable enough to be scanned without damage or which have already been well photographed?
- i. What materials are used most frequently, and they used, and where are they located?
- j. What materials are unique to the institution, and where are they located?"

In order to collect a variety of view points as given above, the Handbook for Digital Projects advises to use two nomination forms, one for selection and the other for deselecting. This exercise is considered to be very important.

Evaluation

The Selection Committee or the Sub-Committee in a particular discipline should examine the suggestions made and decide on which items to be included and deleted.

The Selection Committee should evaluate the recommendations made and deselect, if found necessary, according to international practices set for this purpose. The following principles which are based on the recommendations given in the Handbook for Digital Projects need to be kept in mind:

- a. Mission Statement is the document to be digitized falling within the purview of the project? If not, don't digitize.
- b. Scope of Collections Statement: If a complete collection is digitized, confirm that the document to be digitized falls within the repository scope of the collection.
- c. Deselecting Requests from the Supporters of the Project: If the supporter of the Project recommends that the document should be digitized and they are challenged by equally important sources not to digitize, the document should not be digitized. However, if the selection Committee finds deselecting recommendations frivolous or insubstantial, then ignore them.
- d. Donor Restrictions: If the donor of the document to be digitized puts substantial or non-negotiable restrictions which prevents the users to use document according to the policy defined by the institution digitizing the document then don't digitize the document. If the document is important and not available elsewhere try to re-negotiate the terms with the donor.
- e. Copyrights: Don't digitize any document unless you are sure that it is in the public domain or you have obtained copyrights or licenses/ permissions.
- f. Privacy Rights: if a document contains images/pictures of living persons obtain permissions from them before digitizing the text.
- g. Publicity Rights: if the document includes images or recordings of famous persons such as motion picture or recording stars, scientists, artists or authors obtain permission from the persons or their estates before digitizing the text.
- h. IT Regulations: Don't digitize the document which is not permitted under the law or the information Technology Act.
- i. Sensitivity; if the document contains sensitive information on subjects such as defense religion, etc. or is unbalanced in its point of view, the Selection Committee should get the advice of experts before taking a decision on digitization.
- j. Evidential Value: if the document contains material that is evidential in nature or supports events with legal and historical proofs and/or interests a key audience as it has substantial information, then the document should be digitized.



- k. Authenticity ; if the document is authentic and original in contribution it should be digitized.
- l. Visual Accuracy : if the print/appearance of the document supports the creation of an accurate and sharp digital version then digitize it. If not, find alternate methods for doing so.
- m. Documentation: if the document does not have appropriate captions and the budget does not permit to appoint staff to create them, then defer the digitations of that particular document.
- n. Contextualization: if a document essentially needs substantial and expensive research inputs in terms of contextual support such as hypertext support for certain portions or viewing of document in relation with other documents simultaneously, etc. it may be necessary to reconstruct the archaeological support in the Encoded Archival Description (EAD) format or another suitable format. If it is not possible to do so, It would not be Advisable to digitize such a document.
- o. Added Value; IF he document has become available for the first time, it fulfills the necessary conditions laid out for the selection of a document, it is considered necessary to make it available to a larger audience, and then if funds permit, digitize the document in order to:
- Make the unique document available to a larger audience.
 - Create linkages to the document through HTML, SGML, and XML Coding.
 - Make it part of the virtual collections on the same subject using different techniques, format and bringing together physically separated documents either on the Web or in CD form.
 - Add new indexes and searching aids.
- p. Audience: if the digital version and the printed version reached the same audience, yet considering that the document is important to the Indian heritage or is an Indian contribution, the digitization of the document should be considered.
- q. Supplementary Selection Criteria: If the audience creates its own selection criteria, such recommendations should be taken into the evaluation process.
- r. Technology: if the audience cannot afford the expensive equipment for using the digital version, then avoid digitization However, now that Internet is becoming available to more and more users in India , this factor does not apply. However, the technology should be such that every internet user can access the document easily.
- s. Condition: if the condition of the document to be digitized is very poor and it is likely that in the digitations process the document will get damaged, then do not digitize it.
- t. Control: Make sure that rare materials are kept under security during the process of digitization and are returned to the owner in the original condition.
- u. Duplication of Effort: if the document has been digitized elsewhere, locate the source, and find the quality of the digital version. If we can get a copy get a copy for general use, then it is not worth digitizing the document.
- v. Accessibility: if the original document is inaccessible but it is available in microfilm or microfiche form widely, it may not be ideal to digitize the document at this stage.
- w. Cumulation: It the document is relevant as part of a collection only, then the digitization of it alone must be seriously questioned by the Selection Committee and other reasons obtained for its selection before taking a decision for digitization of the document

Prioritization

The final list prepared for digitization purposes should be ranked in the order of priority keeping in mind the relevance of each document in a historical perspective its use in the present context and its physical condition. The international norms for prioritization should be considered.

Digitization; Some Important Management Factors

There are some important factors that help in the management of the documents. These need to be assessed while adopting digitization techniques.

(a) Storage and distribution of data; The use of necessary storage and distribution Systems to provide global access to resources is essential.

(b) Long-term preservation methods: Some sort of assurance that the scanned images will be visible for a long time to come.

(c) Standardization of digitization processes: Standardization for wholesale conversion of paper documents in digital form is imperative.

These criteria are influenced by the evolution of new information objects and contents, the use of metadata and terms and conditions of intellectual property rights. The managers of digitations' jobs have to keep in mind these issues from a global point of view.



Management Aspects of Digital Library Architecture

The management issues need to be examined carefully in view of the fact that low connectivity's poor indexing facilities, lack of Web servers and poor quality document management software can have a major impact on digitization processes. It is therefore essential to have:

- High speed local server and fast connection to the internet
- Relational databases that support a variety of digital formats
- Full-text search engines with efficient indexing facilities
- Web servers and FTP servers
- Electronic document management facility

The facilities

These facilities should accommodate different types of documents including.

- Internet resources
- Primary materials in various digital formats.
- Photographs
- Numerical data sets, and
- Electronic journals.

Preservation

Management of the digitized documents for preservation is an important issue. In this regard the relevance of technical obsolescence has to be taken into consideration. It necessitates the adoption of new technical solutions periodically.

The following three types of "preservation" issues can be considered seriously:

- The preservation of the storage medium,
- The preservation of access to content,
- The presentation of fixed media materials through digital technology

The Preservation of the Storage Medium

The libraries will have to keep moving information in the digital formats such as tapes, hard

Drives and floppy discs from one storage medium to another storage medium.

The Preservation of Access to Context

It is a major issue it is essential to translate data from one format to another while making users to retrieve and display the necessary information. Since migration of data is costly, one has to ensure that in the process there is no distortion or loss of information. The US Commission on Preservation and Access and RLG states "the presentation community is only beginning to address migration of complex digital objects" and such migration remains "largely experimental".

The Presentation of Fixed-Media Materials

Since, there are no common standards libraries need to make CD-ROM and optical disk back-ups regularly. Several types of back-ups will ensure that there is no loss of contents. This is essential.

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