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STORAGE & RETRIEVAL OF DIGITAL DOCUMENTS USING WINISIS & GENERAL-PURPOSE SOFTWARE:A PRACTICAL APPROACH

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Abstract :

Through the present study researcher has developed Storage and Retrieval System for Digital Documents. He has tried to present systematic steps applied to develop Storage & Retrieval system for digital documents using WINISIS and various general-purpose software. It is a module and library professionals can develop the same at their own place by following the steps given. The researcher has tried to develop the module parallel to Green Stone Digital Library Software.

KEYWORDS :

Information Storage, Retrieval, WINISIS, Digitization, Digital Storage .

1)INTRODUCTION:

Today digitization or systematic storage of digital document requires skill, software support and computer hardware. Digitization of a document is going to be easy task, but to store the digital document and retrieve it through specific mechanism is more important and skillful job.

Most of the library software like SLIM, LIBSYS, SOUL etc. does not have facility of storage & retrieval of documents in digital form and modification as per local requirements. Green Stone Digital Library Software is a open source software which does not support changes as per local requirements. The researcher has tried to develop a module for Storage and Retrieval of Digital Documents with the help of WINISIS, which is also open source.

In the present study, it is observed that the WINISIS having strong searching mechanism with 'link' option and application of that with other general-purpose software creates capacity of effective storage, retrieval and actual access to various kinds of digital documents. The researcher has tried to present stepwise approach to develop the module and application of the same to store and retrieve the various digital documents.

1.2) Social Relevance of the Study:

Libraries are the heart of Education System and Learned Society. At present libraries are facing the problems of funds and manpower and on the other hand they have to walk with the present scenario of IT based library services. The software

(Note: The present article is related to Minor Research Project conducted by the researcher)

'WINISIS' which is used in the present study is open source or available free of cost on web. It is able to provide the facility of information storage and retrieval in digital form and provide long-life storage and fast access to all kinds of documents.

1.3) Origin / Statement of the Research Problem:

The researcher is working in the field of librarianship from last ten years and as a part of Ph.D research he has

developed the Modules for Automated Library Housekeeping Operations and Services, which are working effectively and efficiently in Arts, Science & Commerce College, Chikhaldara.

The success of Ph.D research motivated the researcher to extend the research and to develop effective storage & retrieval system, which provides actual access to all kinds of digital documents using WINISIS and other general-purpose software.

1.4) Objectives of Study:

To find out solution on increased cost of library software.
To develop module for fast storage & retrieval of documents in digital form.
To solve the need of storage and retrieval mechanism as per the local requirements of libraries.
To solve the need of storage and retrieval mechanism which can support various IT based library services.

1.5) Scope of the Study:

The study is restricted with the use of WINISIS in storage and retrieval of digital information. In the present study the researcher has tried to apply the various features of WINISIS and other general purpose software like Word, Excel, Windows Media Player, Photo Shop, etc. to store, retrieve and actual access to the information stored in digital form.

1.6) Methodology:

The present study is conducted as an experimental method and actual practical approach is given to design the automated information storage & retrieval system. The system is capable to provide direct access to information stored in digital form. The present study has three parts, first includes systematic storage of digital document, second includes design of bibliographic database for retrieval system and third linking of documents with records stored in bibliographic database.

2) DIGITIZATION OF DOCUMENTS:

Digitization means acquiring, converting, storing and retrieving in standardized and organized manner, with help of modern technical gadgets. Libraries collect and preserve materials in order to serve their information seekers. The most obvious benefit of digitization is to preserve the document for long time in good condition and provide it to the users in digital form, using digital technology. In digitization, resources are preserved for future generation and simultaneously made accessible for current use. Most of the rare materials housed in various libraries of the world are not in good shape and required special preservation techniques. Therefore, library professionals are looking forward, digitizing the documents as a possible solution. By digitizing the library collections, the libraries are not only doing the job of preservation and conservation, but also providing the users easy and remote access to knowledge sources with the help of powerful retrieval tools in the present era.

2.1) Digital Documents:

Digital Document or Information denotes information in machine readable form. The digital documents may be in the form of word, excel, PowerPoint, pdf, jpeg, mpegave, mp3 etc. form i.e. in the form of text, graphic, video or audio form.

2.2) Digital Storage & Retrieval of Documents:

The Information Storage and Retrieval System should be capable to search and to allow a mapping between the users' specific need and the items in the database that will answer that need. Digital Information Storage and Retrieval System is a system that is capable of storage, retrieval and maintenance of information. Information in this context can be composed of text, images, audio, video and other multimedia objects.

The system consists of software that facilitates a user in finding the information the user needs. The system may use standard computer hardware to support the search sub-function and to convert non-textual sources to a searchable media. The gauge of the success of an Information System is how it can minimize the overhead for a user to find the needed information.

Information storage and retrieval (ISAR) involves the representation, organization and storage of information and access to it. The objective of ISAR is to retrieve information that is relevant to the user needs submitted to the system in the form of queries.

The fundamental properties of computer include the storage and retrieval of documents. A system formed to store a particular document at particular location and then retrieve it as per requirement is called as Information Storage and Retrieval System. According to definition, storage and retrieval as per requirement are the two main factors of ISAR system.

The printed documents may convert in digital form by scanning and convert it into various formats like pdf, npg, jpg tec. The other digital documents in various formats can be stored in the various digital storage media like Hard Disk, CD, DVD, Pen Drive, Magnetic Tape etc. The retrieval of one document from limited is easier, but retrieval of specific from vast is difficult.

The researcher has solved the problem by developing automated module using WINISIS and general-purpose software. He has designed two mechanism one for storage and another for retrieval. The retrieval mechanism not only provides bibliographical details but also direct access to the stored document in the system. For storage, the hard drive of

computer is used in systematic way and for retrieval, WINISIS is used with "Link" option.

2.3) WINISIS :

CDS/ISIS for Windows is an information retrieval package developed by UNESCO, which runs on Microsoft Windows. CDS/ISIS version 1.4 was circulated on CD-ROM to distributors in March 2001 and now it is available free of cost on www.unesco.org/webworld/isis. The WINISIS has all the features, which CDS/ISIS DOS base software has. Apart from these, various additional features are there which supports to use or operate more than one database at a time and to link them with each other and the file with other software. One can modify or make change in the database as per the requirements, it facilitates unlimited data entry, creation of databases in thousands, powerful indexing and searching technique. It is easy to handle, easy for backup. The "link" option of this software facilitates hyperlink between bibliographic database and various documents in word, pdf, jpg, etc. which may help in digitization of library and library services. Because of this special feature, the researcher has used the software to store and retrieve various kinds of documents in digital form.

3) STORAGE & RETRIEVAL OF DOCUMENTS IN DIGITAL FORM USING WINISIS & GENERAL-PURPOSE SOFTWARE:

In the study researcher has tried to present the actual practical approach given to Storage & Retrieval of documents in digital form using WINISIS and various general-purpose software. In general, design of storage & retrieval system means to store bibliographic data about the documents with various keywords or access points and retrieve the same as per user's requirement using the same keywords.

However, in the present research researcher has tried to design a mechanism, which will retrieve the bibliographic data and display or provide access to actual document through the Information Storage and Retrieval System.

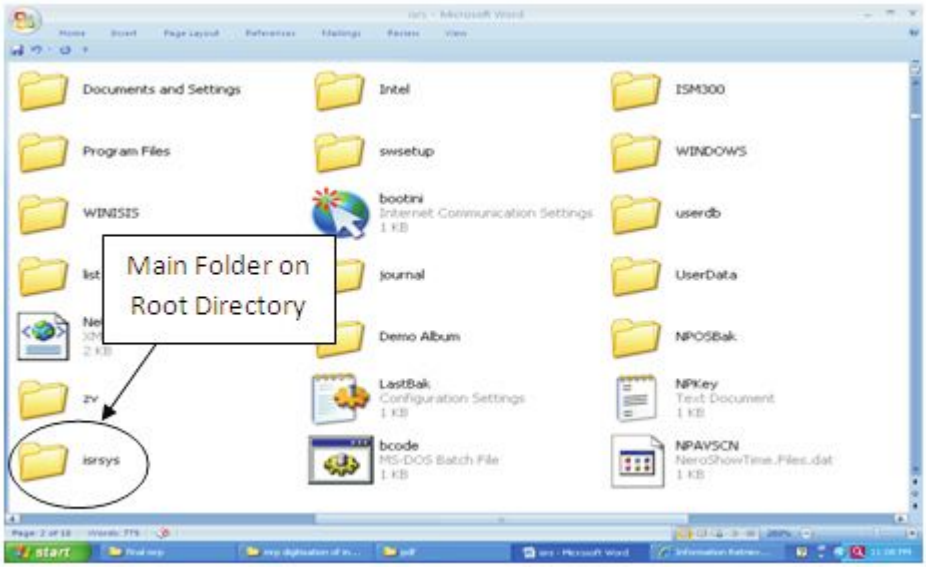
3.1) Working of Information Storage & Retrieval Systems:

The digital information storage & retrieval system must (1) actively find out what users need, (2) acquire documents (or computer programs, or products, or data items, and so on), resulting in a collection, (3) match documents with needs and (4) access to actual digital document.

In digital information storage and retrieval system computer hardware, software and mechanism to retrieve and display require information is essential. In the present study, the researcher has used the Hard Drive of computer as storage media and WINISIS software to develop retrieval mechanism. The design and development of database in WINISIS with additional features and application of various general-purpose software helps to display the retrieved document available in any file format.

3.2) Storage System:

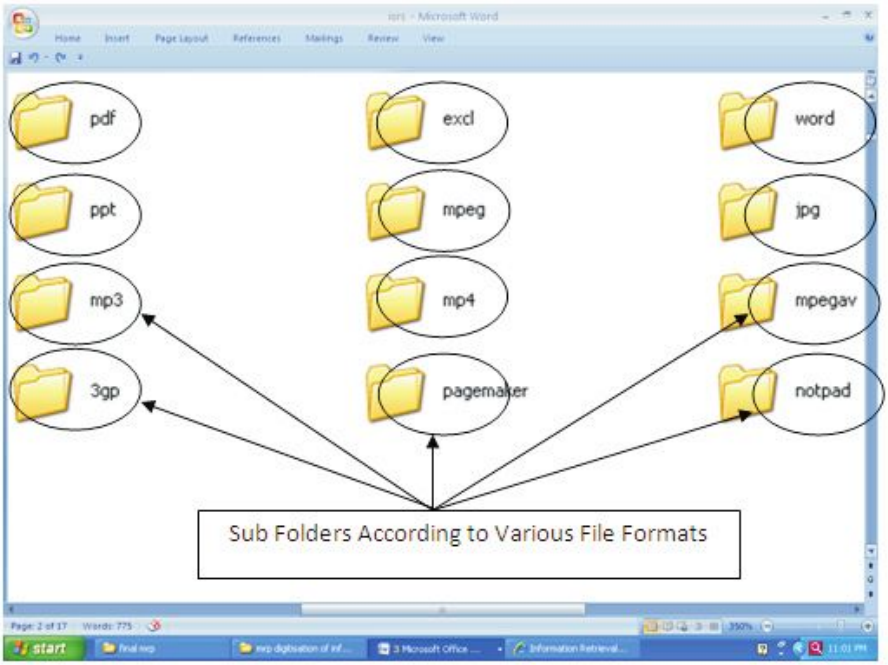
For the storage of digital documents researcher has used the root directory of computer i.e. 'C drive of the computer'. The researcher has created specific folder entitled 'isrsys' as shown in the window no.1 to store sub-folders. In the storage system the root or path for the main folder is "C:\isrsys".



Window No.1 Showing Main Folder on Root Directory

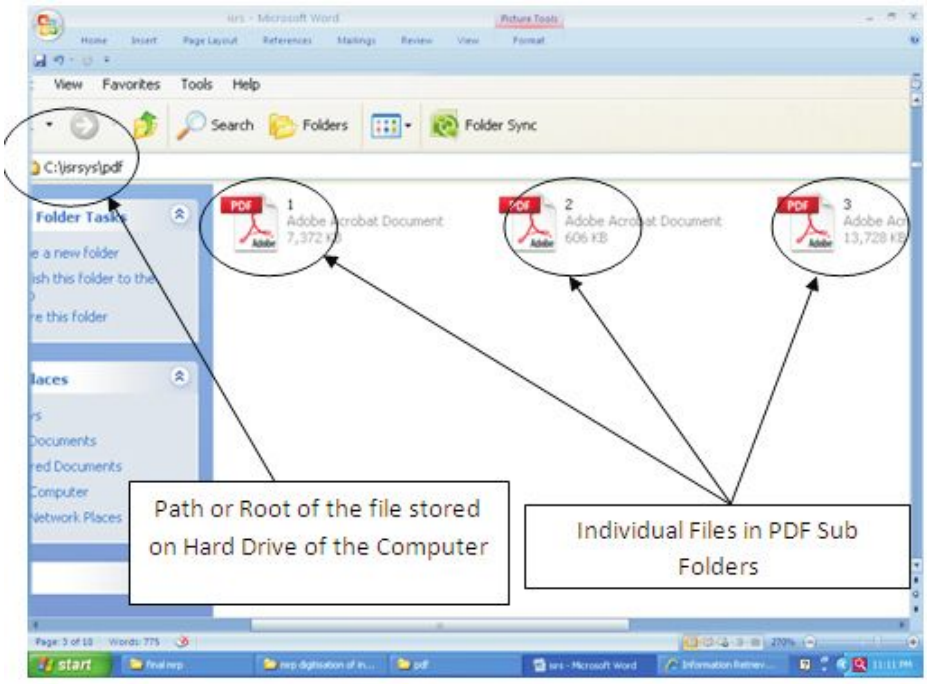
The main folder is divided into various sub-folders i.e. the researcher has created various sub-folders according to the various file formats as shown in the window no. 2. The sub-folders are entitled with pdf, excel, word, ppt, mpeg, jpg,

mp3, mp4, mpegav, 3gp, notpad and pagemaker to store the related documents. The roots or paths of the sub-folders are "C:\isrsys\pdf, C:\isrsys\excel, C:\isrsys\word and so on". The sub-folders help to store the related documents at one place systematically and may be added as per requirement for other file formats.



Window No.2 Showing Sub-folders According File Format

The actual documents were stored in the related sub-folders as shown in the window no. 3. Serial numbers were given to all the documents contained in the sub-folders to avoid the complications in identification of individual document and simplify the process of allotment of path in the retrieval system. In ISR system the paths for the individual document are "C:\isrsys\pdf\1.pdf, C:\isrsys\pdf\2.pdf and so on". In this way path for the each individual document is kept different and the same is used in the retrieval system to recall and display the specific document on the computer screen.



Window No.3. Showing Files Stored in Sub-folders

Above three windows shows the systematic approach given to the storage of digital documents. In the storage system root or the path of the individual file is important and the same is used in the retrieval system to recall and display the document.

3.3) Retrieval System:

In the present study, Retrieval System is developed by designing a database in WINISIS. The database is used to store the bibliographic details about document and to store the file path of the document. The powerful index and search technique available in WINISIS helps to retrieve the related document from the system and the "LINK" option used in the database helps to open the retrieved document in concern file format.

The database designed in WINISIS has four main components are "Field Definition Table, Data Entry Worksheet & Style of Data Entry, Print or Display Format and Field Select Format". All the components are correlated to each other and depend on each other. Change in one or mistake in one component may affect the whole retrieval system.

3.3.1) Design of Retrieval System:

In this part of report, the researcher has focused on the steps considered and adopted for database design in WINISIS for Retrieval System.

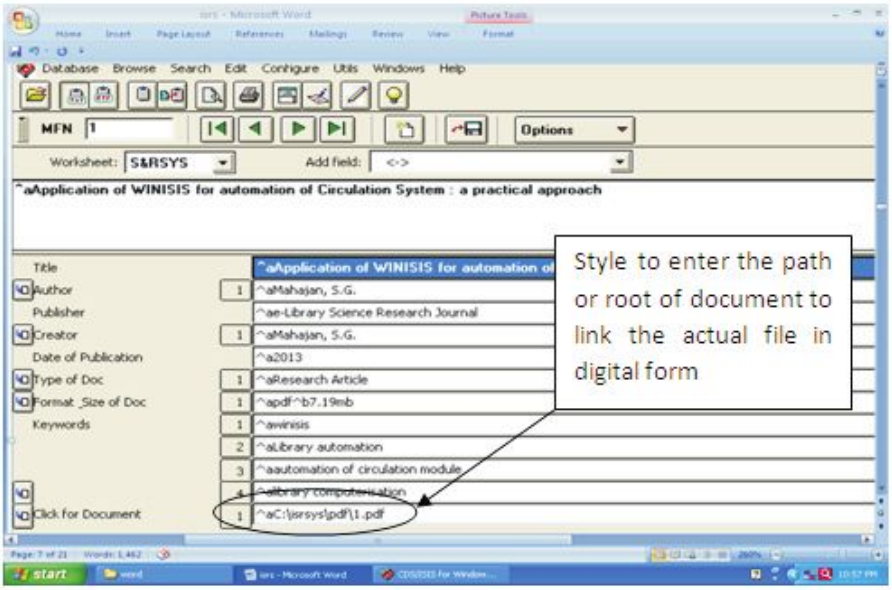
3.3.1.1) Field Definition Table for database of Retrieval System:

Sr. No.	Tag No.	Field Name	Field Type	Repeatable or Not	Subfields
1	20	Title	Alphanumeric	-	Abcd
2	40	Author	Alphanumeric	R	Abcd
3	50	Publisher	Alphanumeric	-	Abcd
4	60	Creator	Alphanumeric	R	Abcd
5	80	Date of Publication	Alphanumeric	-	Abcd
6	100	Type of Document	Alphanumeric	R	Abcd
7	120	Format & Size of Document	Alphanumeric	R	Abcd
8	140	Keywords	Alphanumeric	R	Abcd
9	160	Click for Document	Alphanumeric	R	Abcd

The database for Retrieval System is designed with Nine Main Fields as shown in the Field Definition Table. Each Main Field is subdivided into Four Sub-Fields. The Tag Number and the Sub-fields are provided for further development in the database if necessary.

3.3.1.2) Data Entry Style and Worksheet for Retrieval System:

Window no.4 shows the pattern or style to enter the bibliographical details about the documents. The bibliographical details entered in the worksheet helps to search and recall the document. Each record such entered also provides access to the actual document in digital form. To access the digital form structure of data entry for the path or root is shown in the oval. In the worksheet "^a" used in every field denotes Sub-field of the Main field. With the help of Print Format, the data entered in the record gives output in the form of window as shown in window 4. In the present study, data of few digital documents is entered as sample and to test the various utilities and reports.



Window No.4. Showing Data Entry Style and Format of Worksheet.

3.3.1.3) Print Format Required for Retrieval System:

Third important component of the retrieval system is print format, which helps to display the details of document and provides direct link to the digital document. To access the digital document researcher has used the format technique as shown below in the bold font. The structure of data entry and print format together gives output in the form of Display Window of Retrieval System useful for the users.

```
c26,fs50,'Information Storage & Retrieval System'/#
fonts((modern,Courier New),(roman,Times New Roman),(swiss,Arial)),
cols((0,0,0)),
fonts((modern,Courier New),(roman,Times New Roman),(swiss,Arial)),
cols((0,0,0)),
cl10,f1,box(1)'MFN: 'mfn(4),tab(3556),{cl8,fs32,b'IRS SYSTEM'}/#f2,cl4,m(3556,-3556),cl4,fs30,
if p(v20) then {cl1,fs24,i,'Title:'},tab(3556),v20^a/fi/
(if p(v40) then if occ=1 then {cl1,fs24,i,'Author:'}fi,tab(3556),v40^a/fi/),
(if p(v60) then if occ=1 then {cl1,fs24,i,'Creator:'}fi,tab(3556),v60^a/fi/),
if p(v80) then {cl1,fs24,i,'Date of Publication:'},tab(3556),v80^a/fi/
(if p(v100) then if occ=1 then {cl1,fs24,i,'Type of Doc:'}fi,tab(3556),v100^a/fi/),
(if p(v120) then if occ=1 then {cl1,fs24,i,'Format & Size of Doc:'}fi,tab(3556),v120^a/fi/),
(if p(v140) then if occ=1 then {cl1,fs24,i,'Keywords:'}fi,tab(3556),v140^a/fi/),#
tab(3556),link(('Click for Document'),'OPENFILE ',v160^a)/#####
qc,fs20,'Design & Developed by Dr. Sachin G. Mahajan'/
```

3.3.1.4) Field Select Table Required for Retrieval System:

Sr. No.	Tag Number	Field Name	Indexing Technique	Format
1	20	Title	4	mhl,v20
2	40	Author	1	mhl,(v40/)
3	80	Date of Publication	1	v80
4	100	Type of Document	1	v100
5	120	Format & Size of Document	1	v120
6	140	Keywords	1	v140

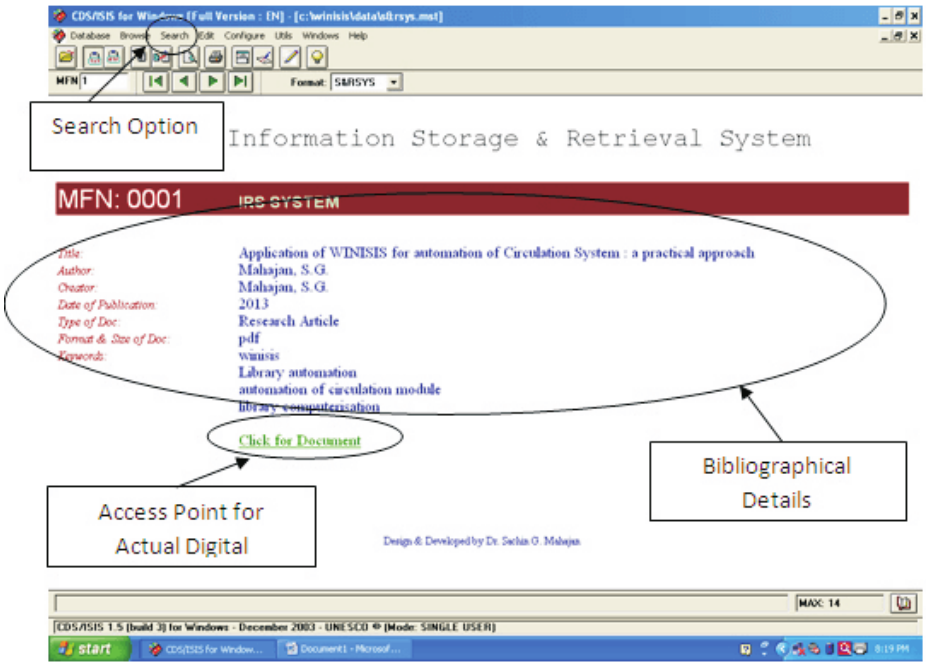
In the Information Storage and Retrieval System, Indexing and Searching mechanism is very important. The given Field Select Table designed for the six fields with the specific Indexing Technique helps to design the term dictionary for important searchable terms, words or keywords. The retrieval system is capable to search the records as per the keywords stored in the term dictionary. The recall and precision of the retrieval system is depends upon the keywords provided for the document and the indexing technique used for the various searchable fields.

It is clear that all the four components used for database designed for retrieval system are correlated and having equal importance.

3.3.2) Working of Information Storage & Retrieval System:

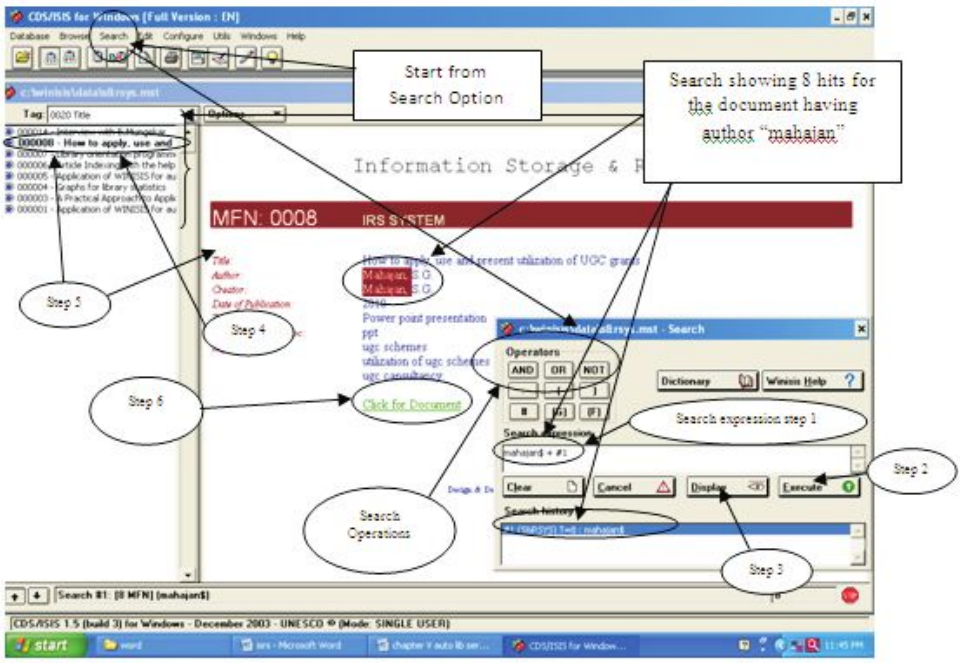
The four components of WINISIS provides and generates access window for the retrieval system as shown in the window no. 5.

This part of the study discusses systematically how the retrieval system retrieves the bibliographical details with the actual digital document.



Window No.5. Access Window of Information Storage & Retrieval System.

The window no.5 given above acts as access point for Information Storage & Retrieval System. The search option shown in the window provides two types of search one is expert search and second is guided search. The detailed procedure for using search option to retrieve required document and to access actual digital document is discussed in the forthcoming windows.

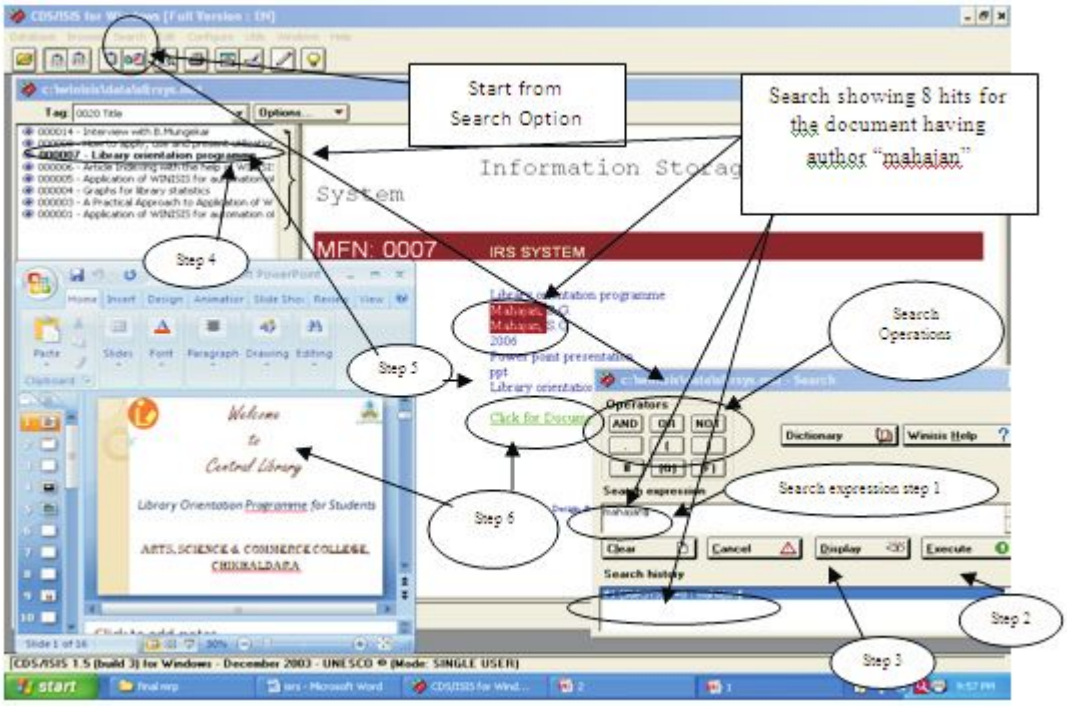


Window No.6. Window Showing Retrieval Procedure.

Window no.6 shows systematic approach to the retrieval of document. Actual retrieval procedure starts from the search operation as shown in the window. After opening the search window at very first step user has to input the search query, second execute the search and third display the search result. Completion of three steps, system displays the retrieved documents as shown in the step four. In step five, user has to click on the required document from the retrieved; the system displays the bibliographical details of the document. The step six is used to display or access to the actual document stored in digital form. The option given in red color "Click for Document" directly opens the document in digital form. In this way, the database is used systematically for the retrieval procedure.

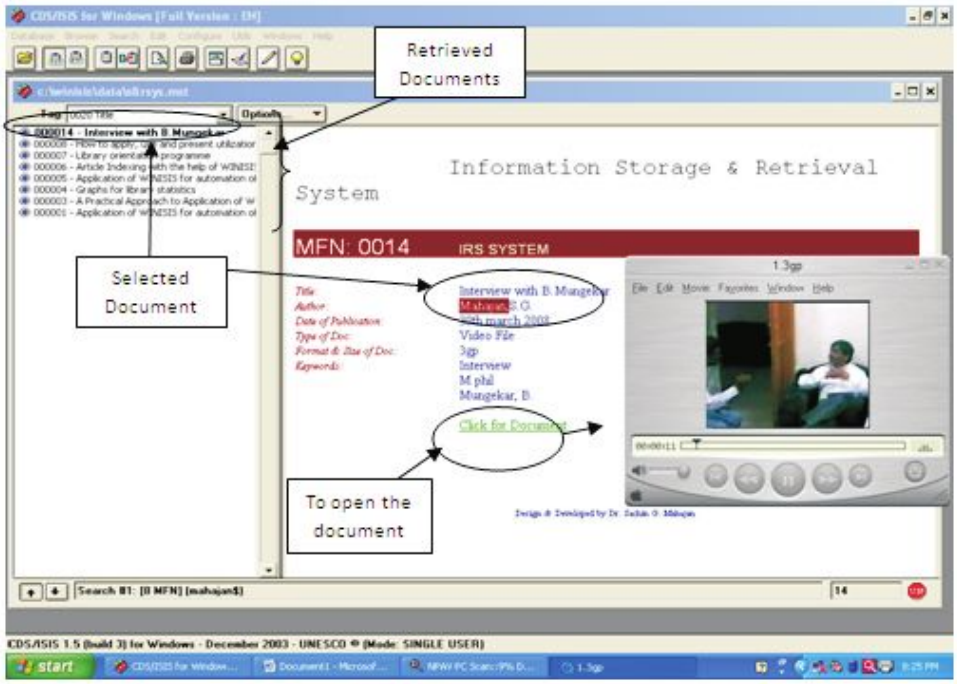
Window no. 6 shows that, the researcher has put the query for an author entitled "mahajan", after execution, the

system shows eight hits related to the query. The selection of one document at step four helps to display the bibliographical details of document entitled "User Orientation Programme for Students". The word used while inputting the query is highlighted in red color. The option given in red color "Click for Document" as shown in the step six opens the document having extension "ppt" in the software "Microsoft Office PowerPoint" as shown in the window no. 7.



Window No.7. Window Showing Retrieval Procedure & Direct Access to Document in PowerPoint format.

Window no. 7 shows how the database designed for retrieval system is used to retrieve the bibliographical details of document and provides access to digital document in the PowerPoint formats from the storage system. In the same way the retrieval system is able to provide access and display the actual document in file format of Word, Excel and Pdf also.



Window No.8. Window Showing Retrieval Procedure & Direct Access to Document in 3gp format.

The searching technique to retrieve digital document is same for all file format. Each time the link option given in red color "Click for Document" provides access to the document related to the retrieved bibliographical details. The window

no.8 provides access to the document entitled "Interview with B.Mungekar". The document shown in the retrieval is in "3gp" file format. In the same way, the system is capable to search and provide access to the digital files in the form of "MPEGAV, mp3, mp4, jpg, jpeg, etc."

From the above practical approach, it is clear that the WINISIS supports to various file formats and therefore it is confirm that effective storage and retrieval of various kinds of document in digital form with the help of WINISIS and general-purpose software is possible. Like the Green Stone Digital Library Software one can establish his own digital library or Information Storage & Retrieval System with the help of WINISIS.

4) FINDINGS AND CONCLUSIONS:

The general-purpose software used in the system are easily available on each computer, whereas WINISIS is open source software available free of cost on web. The powerful Indexing and Searching Technique and the Link option available in WINISIS help to fulfill the very objectives of the present study.

4.1)Findings:

The overall general findings of the present study are as follows:

1.Effective storage and retrieval of various kinds of document in digital form with the help of WINISIS and general-purpose software is possible.
2.WINISIS supports local variation in Information Storage & Retrieval System.
3.Linking of fields with files in various software is possible. Like (Word, Excel, Power Point, Windows Media Player, Image Viewer, Quick Time Player, Internet Explorer etc.)
4.Linking of fields with various file formats like (pdf, jpg, jpeg, doc, ppt, mpegav, etc.) is possible in WINISIS.
5.Quick and pinpointed search is possible with the help of AND, OR and NOT Boolean operators.
6.Field Specific search option supports to increase the precision ratio in the search.
7.The Storage & Retrieval System developed with the help of WINISIS is easy to operate, easy for data entry and easy to modify.
8.As open source software, use of WINISIS for Storage & Retrieval System may stand as ideal for digitization of libraries in developing countries like India.

4.2)CONCLUSIONS:

The present work is useful for the libraries having problems of funds to purchase software for digital storage and retrieval system. This research work may help the library professionals to develop their own storage and retrieval system as per local requirement. The same system may be used for Institutional Repository, Automated News Paper Clippings, Digital Repository and Digital File Management.

Persons having basic knowledge of computer and library science can use WINISIS effectively for library services and functions. Various new databases or menus can be developed as per local requirements.
WINISIS, which has been passively ignored as a mere cataloguing and indexing software, is emerging as a software tool for creation of digital archive containing text, pdf, audio, video, excel or similar types of documents. Anyone can create searchable archive of full text digital documents easily with WINISIS and can manage it conveniently for effective information services. One can treat such a digital document archive as a proto-type digital library.

The use of WINISIS for digital archiving and digital repositories in the libraries can help in transforming libraries into knowledge centers and the librarians into knowledge managers.

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