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## **LOCATION-ORIENTED DIGITAL LIBRARY SYSTEM**

**Douglas, Minafa-a Thompson & Asagba, Prince Oghenekaro**

Department of Computer Science  
University of Port Harcourt., Nigeria

### **ABSTRACT**

Even as Information Technology evolves, Libraries have been concerned with storing and retrieving information in the media it is created on. Libraries had to make maximum use of information retrieval methods to facilitate the storage and retrieval process. The Database of books was managed through the Software developed with NetBeans Java as the Front-end and MYSQL Database platform as the Back-end. The Proposed System consists of the following modules: viz Data Entry, View/Print (Report), Search. Object Oriented Analysis and Design (OOAD) Methodology was adopted, as it allows program re-use and maintenance. The system developed will allow authorized Users have complete access to them. The System is location-oriented; geared towards acknowledging the source of the file, thereby promoting the accuracy and authenticity of information.

**Key Words:** Information Storage, Information Retrieval, Digital Library.

### **Introduction**

Before the advent of Information Technology, Libraries have been organizing reading materials on shelves for easy access. Prior to this, Readers made use of some adopted systematic traditional Information retrieval methods and tools, such as classification, cataloguing, vocabulary control as well as traditional manual indexing systems, for the organization of Library materials and their recordings[1].

Today's Information Professionals should know and be conversant with these traditional methods as they show the process of evolution of Information Retrieval (IR). Hence, these traditional methods cannot be discarded, as they act as base to these evolution and recent

developments in Digital library and Web environment have their roots in these traditional tools and methods [2].

They are rather the future of traditional libraries, much as medieval manuscript libraries simply became a specialized and much revered part of the larger print-based libraries that we have today [4]. [1] In their findings said, the word 'Information Retrieval' was first used in 1952 and became popular in the research communities from 1961[2]. Before this time, Information retrieval's organizing function was seen as a major breakthrough in Libraries that were no longer just storehouses of books, but as places where information was catalogued and indexed.

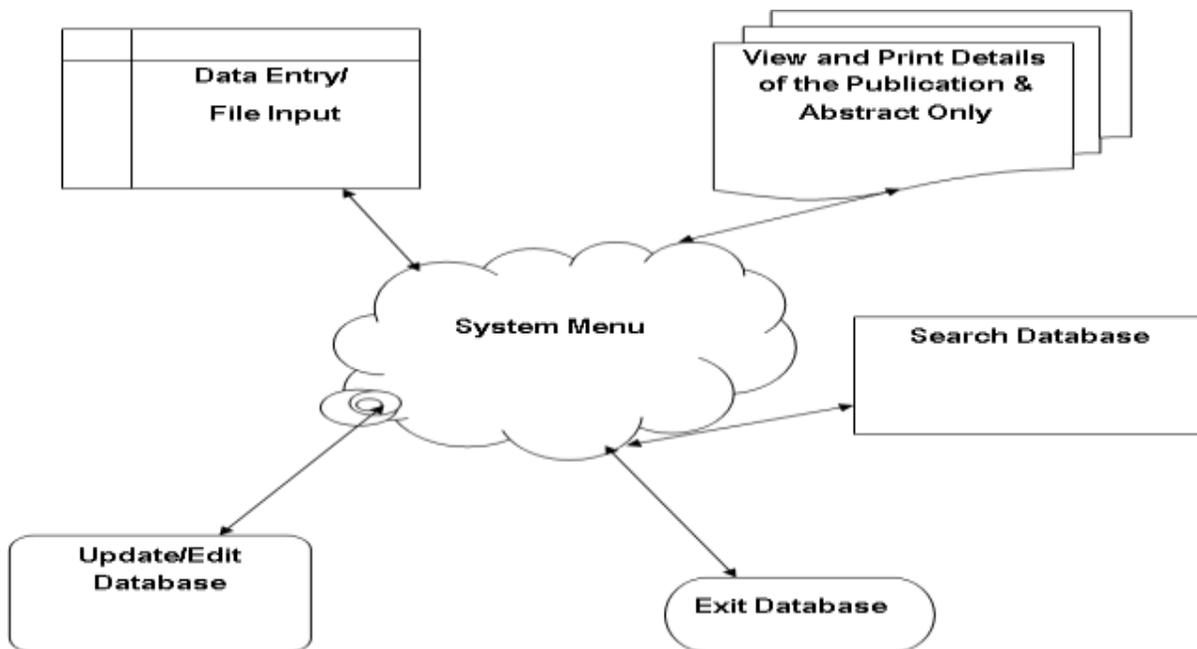
Information Retrieval (IR) System involves searching for and retrieving stored computerized data. It presupposes that there are documents or records containing information that have been organized in an order suitable for easy access/retrieval. It does not change the knowledge of the user on the subject of his enquiry; it merely informs him of the existence or non existence and whereabouts of the documents relating to his request [2].

## **Literature Review**

The Study reviewed a lot of established work on Information Storage and Retrieval System, which include: [5] They, came up with 'FREENET'; a distributed anonymous information storage and retrieval system. [6] Came up with an information storage and retrieval system called the 'Electronic Law Companion', which stores over 80,000 issues of Law cases and all Nigeria's Federal Legislation and several States' Rules of Court. It empowers Legal Practitioners and academics to quickly and easily have access with just a click. It allows for update. [7] mentioned DIALOG, which is an online Information Retrieval System present in the 1960s and 1970s, signifying the shift from manual to computerized Information Retrieval (IR) with features such as online thesauri, ranked output automatic inclusion of synonyms in the search formulation, Boolean logic, right hand and Left hand truncation etc. but DIALOG cannot be accessed directly by users without formal training or assistance from information Professionals. [8] , [9] mentioned 'ERIC' (Education Resources Information Centre), Database sponsored by the U.S. Department of Education to provide extensive access to educational related literature. ERIC provides coverage of journal articles, conferences, meetings, theses etc. Searching ERIC requires

the use of Descriptors or keywords. This paper adopts the concept of [10]. They designed and developed a Database of books is managed through SOUL software and CD-ROM abstract databases. The system has an MS-access database backbone which stores the following information: document/source of information; source of publication; author(s) or editor(s) or compiler(s); publishers; data entry operators; and users. Users of this system have access to the basic information about the journal or article, but not the material itself. Users can read only the abstract of each material, but still have to go through the difficulty of searching for the material elsewhere.

This constitutes a major limitation; which the proposed system in this study seeks to address. The Proposed System will allow Users to have access to the basic information about the journal or article and the material itself. Users will not go through the difficulty of searching for the material elsewhere. However, this Study intends to make some modifications that will enable Users view and read the whole or full-text documents with the help of the Pdf viewer component. Figures 1 and 2 show the Architectural structure of the Existing System and the Proposed Architectural Structure respectively, while Table 1, shows the difference between the Existing and Proposed Systems.



**Fig. 1: Architectural Structure of Existing System of Ahmad and Bhat, 2009.**

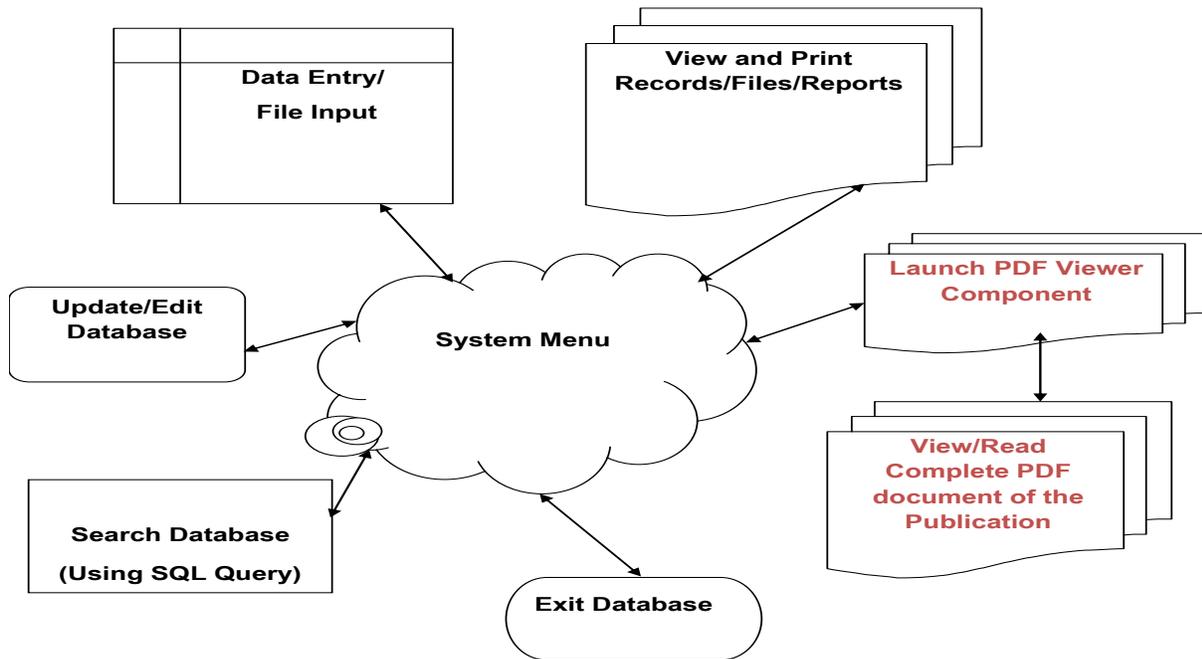


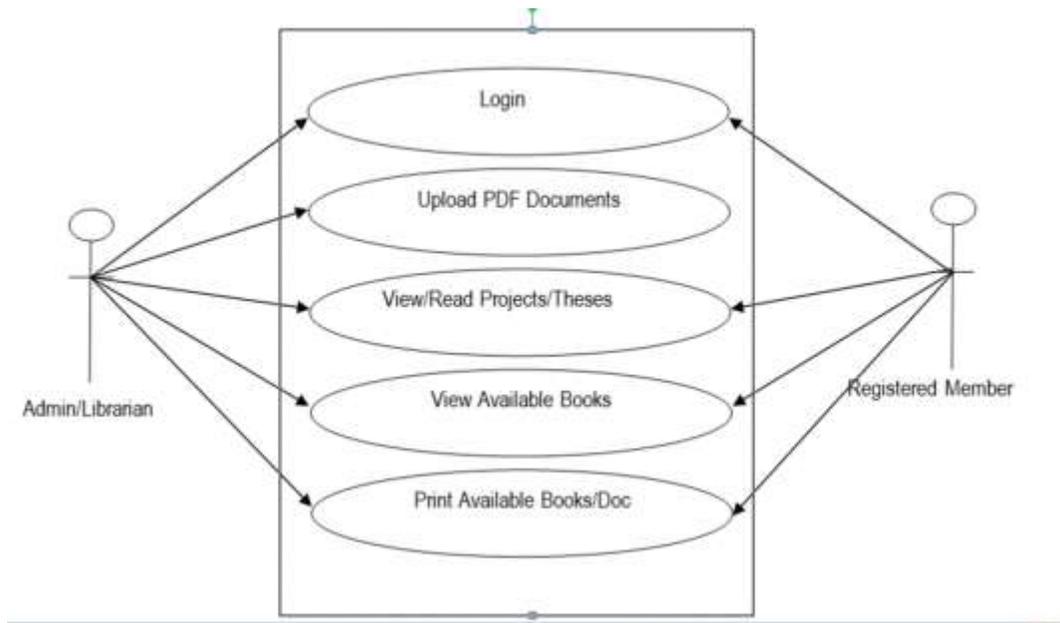
Fig. 2: Architectural Structure of our System, showing slight modifications of the Existing System.

Table1: The Difference between the Existing System and our Proposed System

The Existing System	The Proposed System
Restricted accessibility	The entire Theses, Journals in the Database can be accessed
Has limited storage capacity, has Ms Access as its Database	Using MYSQL as the Database serves as a greater advantage over the existing system.
Cannot easily be transferred to other Operating Systems	It can run on any Operating System
Visual Basic 6.0 doesn't promote Object Oriented Programming (OOP).	Object Oriented Analysis and Design (OOAD) model promotes object oriented programming
The source of the file (the file location)cannot be accessed simultaneously	The source can be accessed or seen.

## Design and Development of the Database

MYSQL Database was chosen for developing the Information Storage and Retrieval System in Digital Library with location-oriented capability (i.e. while uploading or viewing the document the File Location (URL) will be seen). The Database is structured to make data entry as easy, logical, and error-free as possible. It consists of tables indicating the field name, field type, field width, and field description, which enable users, use keyword to view, search, print the full Pdf materials. We used Object Oriented Analysis and Design Model to arrange the objects used in developing our System and this makes it easy for objects in different classes to interact for easy operability. We used Java programming language, as it is portable and has independent platform. Figure 3 shows the Use Case Diagram of the Proposed System.

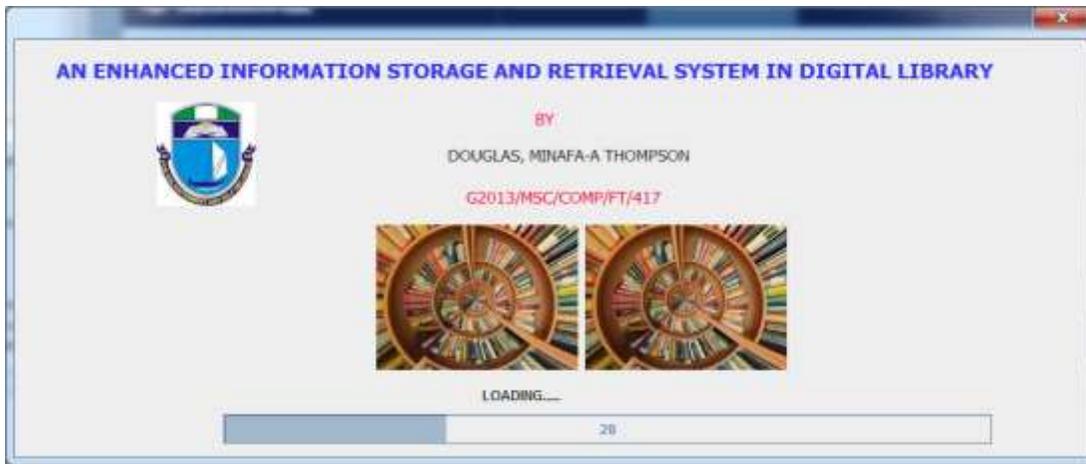


**Fig 3: The Use Case Diagram of the Proposed System**

The Use Case Diagram of the Proposed System models the interaction between the System and the External Users. The Admin/Librarian is permitted the following privileges of : login, uploading, viewing/reading, printing available materials in the Database while the Registered member is given access to all except uploading materials and adding new members.

The directives on how to use or run the Proposed System is as follows:

1. Click on the folder containing the program
2. Double click on the library.jar
3. Wait for splash or welcome page to finish loading
4. Login
5. If the user is a registered member, he/she will be taken to the User Dash Board where he can now search, view, read etc the Pdf files. Figure 4 shows the welcome page that is loading. Tables 2 and 3 show experiments 1 and 2 respectively.



**Fig 4: The loading Welcome page**

**Table 2: Parameter Values in Experiment 1**

Parameter	Value
Keyword	1
Searched Document	1
Available	1
Unavailable	0

**Table 3: Experiment 2**

<b>Question</b>	<b>Answer</b>
Can Pdf file be viewed as the program is running?	Yes
After reading the document, can user open another document to view?	Yes
Can user print list of available documents in the digital library?	Yes
Can the file location be seen?	Yes

### **Discussion of Results**

- One Keyword at a time for the search
- The answers to the questions in the 2<sup>nd</sup> table were all in the affirmative.
- Both abstract and full text can be accessed i.e.
  - viewed
  - printed, if so desired.

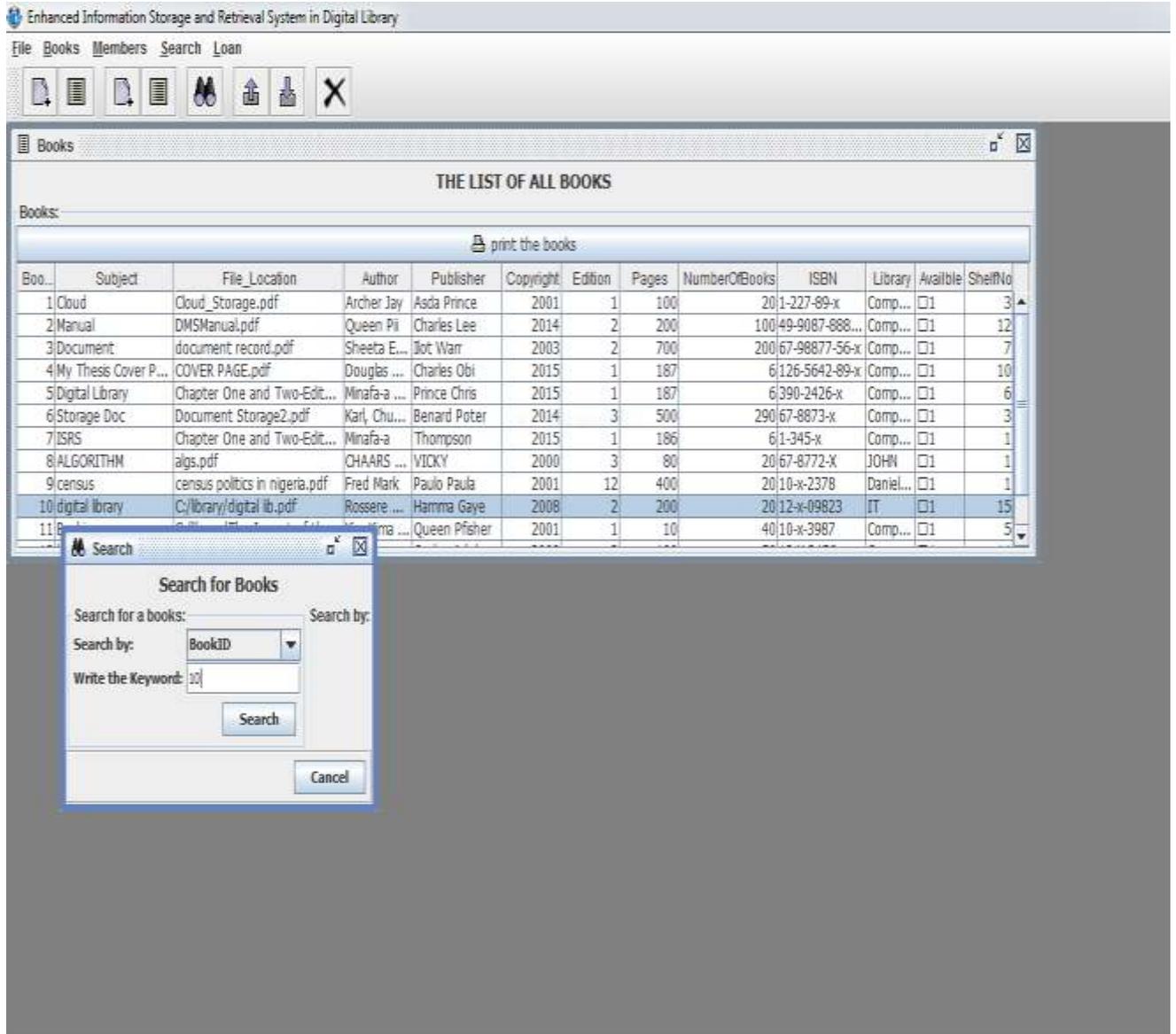
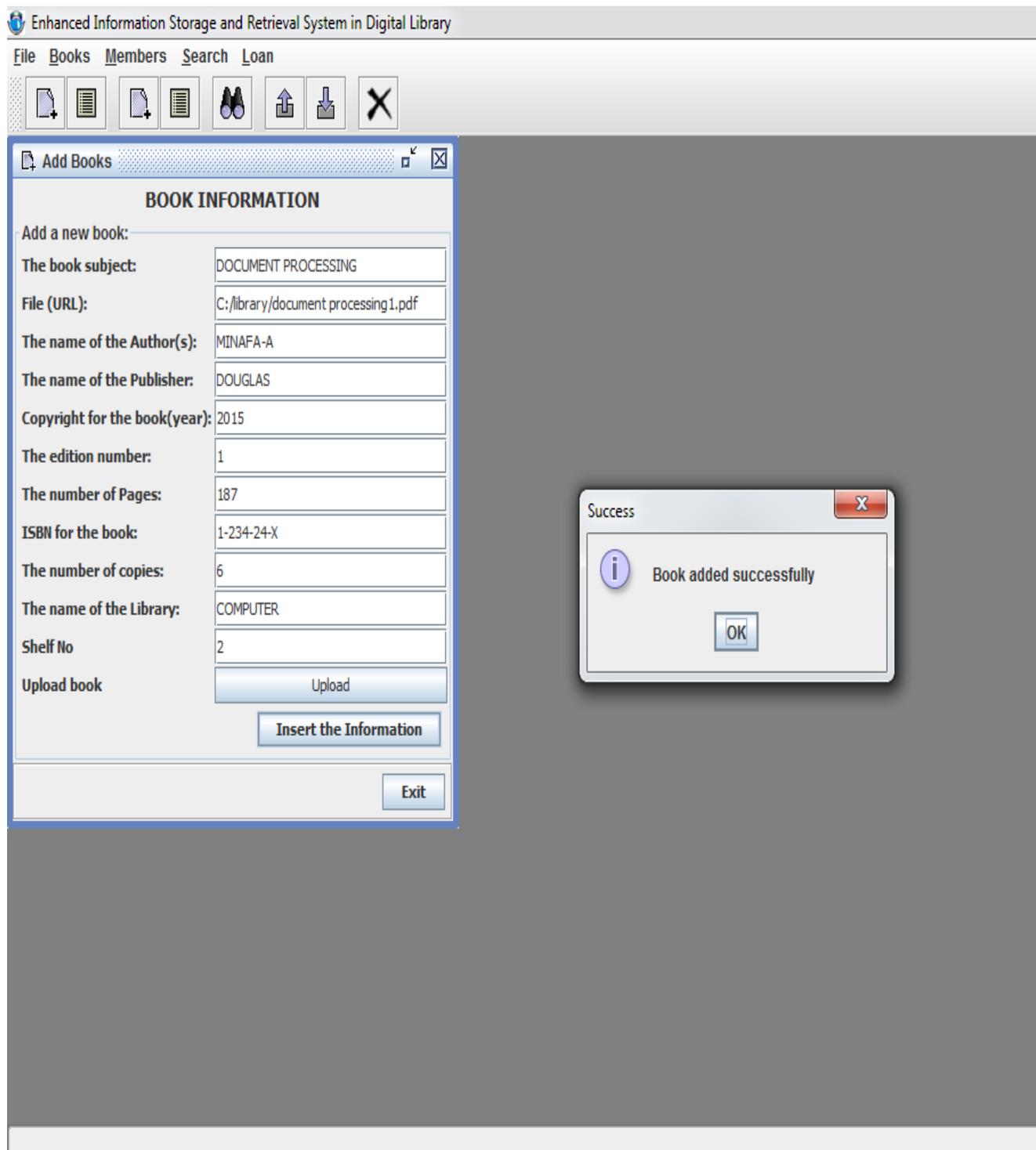


Fig 5 shows Searching by Subject ID



**Fig 6 shows the successful uploading of Book by the Librarian.**

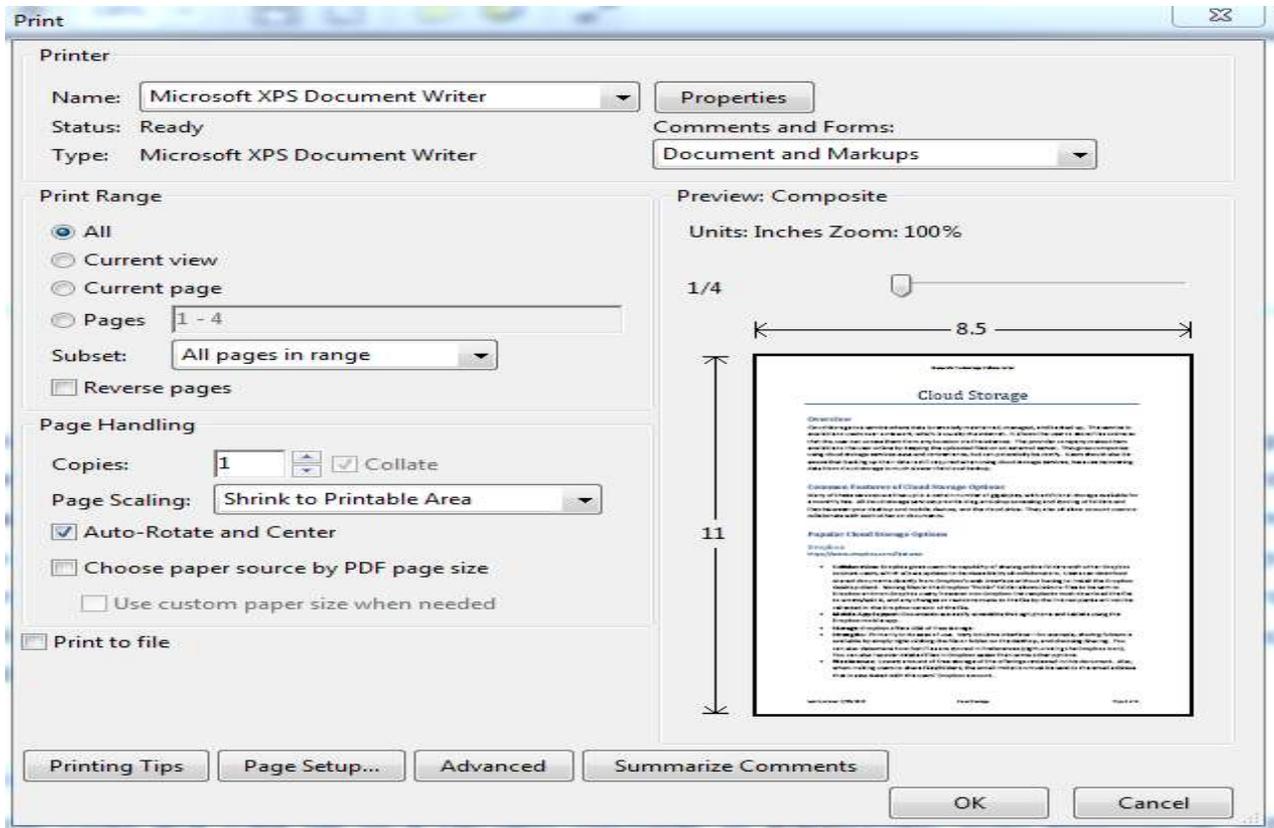


Fig 7 Displays the printing of a Document.

## Conclusion

The System is location-oriented; geared towards acknowledging the source of the file, thereby promoting the accuracy and authenticity of information. The Java programming language was used to design interactive interfaces at the front-end and MYSQL server at the back-end. Object Oriented Analysis and Design (OOAD) Methodology was adopted, because it enables program re-use and maintenance. The System developed, captured the Source File-Directory or the URL to authenticate or improve the Information Storage and Retrieval System in Digital Library.

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