Technical Processing of Documents through SOUL 2.0: An Analytical Study of BHU Library System

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Abstract
A library of any type or size implies the close collaboration of the documents, the users and the library personnel. Library personnel play intermediary role in between the user and his or her document of interest. The services provided by library staff comprise a series of jobs mainly acquiring, preparing and preserving the documents which is also known as housekeeping operations. These activities are highly cumbersome, fatigue and labour intensive, basically routine clerical works performed slowly and expensively by human beings. So why, it is needed to automate and mechanize the system of document processing in such a way to get more error free and fast services. With the advent of Information and Communication Technologies (ICT), libraries are increasingly attempting to automate some of these activities for minimizing human clerical routines and thereby making library staff more productive and enabling them to provide fast and comprehensive information through services. Academic libraries are an important component of the modern institutions for the management of knowledge for further research and development. Banaras Hindu University Library System is the biggest university library system in India which has adopted SOUL 2.0 software for the automation of the holdings of central library and 35 departmental libraries. The main aim of this paper is to describe features of the catalogue module of the SOUL software and analysis of the features, limitations, and requirements for the technical processing of documents through SOUL software in BHU Library System.

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Keywords: Automation, Library Automation, SOUL 2.0, University Libraries.

1. Introduction

A library of any type or size implies the close collaboration of the documents, the users and the library personnel. Library personnel play intermediary role in between the user and his or her document of interest. The services provided by library staff comprise a series of jobs mainly acquiring, preparing and preserving the documents which is also known as housekeeping operations. The library operations which involve functions such as charging and discharging of books, acquisitions of materials, cataloging and classification including typing of catalog cards, and filling of cards in cabinets were done manually. The whole operation was quite tedious for both library staff and users. Due to large number of collection of documents and many libraries, it was very difficult to locate and find the required documents by the users. In spite of the challenges automation brings, its benefits quite outweigh its disadvantages. It is a known fact that automation enables easy access to library materials, and allows staff to better serve users and facilitate a multitude of tasks such as acquisitions, cataloging, circulation, and reference **(Egunjobi, 2012)**.Academic libraries like university libraries and college libraries are also tend to automate their system and services with the help of government funding and allocation of budget to provide automated and online services e.g. OPAC and circulation and serial control. Banaras Hindu University is one of the

first universities in India which has started its automation project in 1996 with creation of database of theses and serial with the help of CDS/ISIS software.

2. Library Automation

The whole automation process in our society began with a librarian Dr. John Shaw Billing. Herman Hollerith, a Census Bureau of USA employee, who invented punched card machinery, attributes the idea to a suggestion by Dr. Billing, the then librarian of Surgeon-General's Library (now the National Library of Medicine). Hollerith formed the Tabulating Machine Company in 1896, which later became the International Business Machines (IBM) Corporation. Over last forty years, the use of computers, information technologies and information communication technologies has made the biggest changes in the library services. The existence of a library system in India is as old as the country itself and the libraries in India have a long history, starting with the chained and closed access libraries of earlier times to the present day, hybrid, digital and virtual libraries that use the latest technology for provision of information through various services **(Mahajan, 2005)**. Library automation projects in India started with the development of Computerised Documentation Services/Integrated Set of Information Systems (CDS/ISIS) in 1985 by UNESCO and its distribution in Indian libraries at nominal fee/ free by the National Information System on Science and Technology (NISSAT). The earlier library automation projects in academic libraries in India were started with the help of CDS/ISIS. There after many library software are developed at commercial and open source level in different computer program language with user friendly interface, OPAC and high search speed like MINISIS, WINISIS, LIBSYS, SOUL, SLIM, NewGenLib, KOHA, E-Granthalaya, VTLS, Alice for Windows etc. **(Rai and Kumar, 2011)**. Libraries and librarians face challenge to acquire the best suitable software for automation.

3. Technical Processing

The technical processing procedure is the pivot around which all the housekeeping operations revolve in a library. It helps in the transformation of a library collection into serviceable resources. The procedures under this subdivision are classification, cataloguing, barcode generation, labeling and shelving. Any LMS can help in classification, cataloguing and barcode generation.

a) Classify: Classification is grouping of similar objects together. It forms the foundation of librarianship. There are two purposes for classification of documents:

- To help the user to find a document whose call number he/she knows
- To find out all the documents on a given subject though collocation

Classification of documents involves analysis of the subject content and representation of the content by class numbers. Thus, it is an intellectual process. So, to automate the classification work, suitable artificial intelligence (AI) techniques are to be used. Computerised processing can help in the classification in following ways:

- By assisting in Duplicate checking
- By assisting in analysis of the subject
- By provision of the readymade class number which is already exist.

b) Catalogue: A basic task in a library is to prepare a catalogue of its collection and maintain it up to date for meeting the information needs of its users. Cataloguing is the prime method of providing access to the collection. The current practices of cataloguing of resources in Indian libraries are listed in figure:
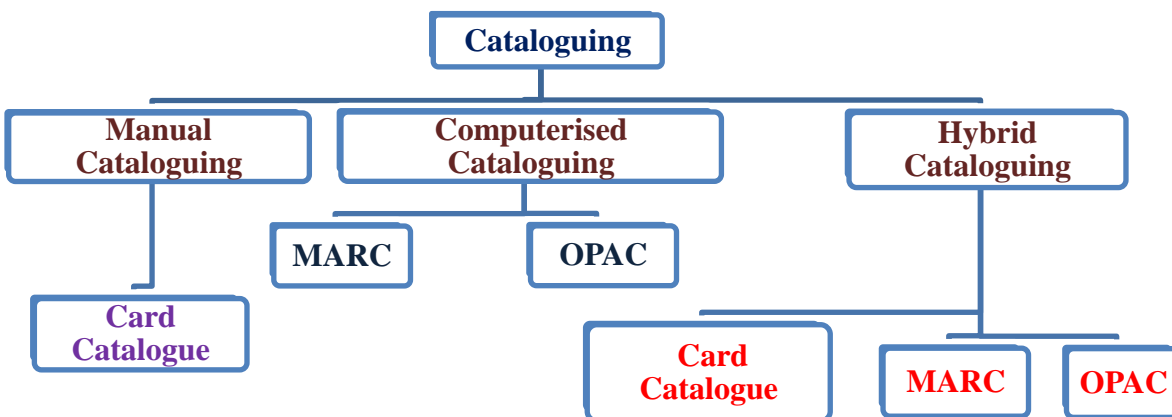
Fig1. Types of Cataloguing Work

In case of manual cataloguing, the cataloguer makes separate cards for author, title, subject, cross-references and analytical entries by following any standard catalogue code (such as AACR II, CCC, etc.) and file them as per the rules laid down by the library. Computerised cataloguing begins with entering bibliographical data in a pre-designed worksheet. The worksheet or datasheet is very similar to data entry form and is based on any standard content designators scheme (such as MARC 21, CCF, UNIMARC, etc.). Finally bibliographical data recorded in the worksheets are entered into the computer to produce machine-readable catalogue file and OPAC. Computer-based cataloguing supports importing of bibliographical datasets for the library resources either from centralized cataloguing services or from other libraries and exporting of bibliographical data from its own collection to other library systems. The recent trend of cataloguing is to utilize Z39.50 protocol to download bibliographical data from other libraries and to provide global access to its own collection through Web-OPAC.

c) Barcode Label: In a computerised environment, various labels are printed by using library management software. In case of barcode-based computerised circulation, accession numbers of documents are converted into barcodes and printouts of barcodes are pasted on the different positions of documents. Table shows the position and size of the different barcode labels used in BHU:

Table1. Barcode labels and its size

Labels	Position	Size
Barcode + Ownership Label	Cover page, last page, date slip,	4 cm x 5 cm
Book Card Label	On book card	4 cm x 5 cm
Spine Label	On the spine of the book	1 cm x 5 cm
Accession No. with Barcode Label	Inner pages e.g. 52, 101, 601	1 cm x 5 cm

4. BHU Library System Automation Project

The BHU Library system, the largest University Library System in the country, germinated from collection donated by Prof. P.K. Telang in 1917 at Central Hindu College, Kamachha, shifted in 1921 to the Central Hall of the Arts College (now Faculty of Arts) and then in 1941 to its present majestic building built with the munificent donation from Maharaja Sayajirao Gaekwad of Baroda. Banaras Hindu University Library System have one central library (Sayaji Rao Gaekwad Library), one college library, one south campus library, three school libraries, four institute libraries, eight faculty libraries, and more than thirty departmental libraries. At present, the university library system is serving more than 30000

students, 1700 teachers and about 5500 non-teaching staffs along with the consultancy to the outside users.

4.1 Collection Development: The Banaras Hindu University Library has a unique collection of Manuscripts, Books, Theses, Periodicals and Journals (hard copies and on-line) ranging from almost all disciplines of Ancient Indian Culture, Philosophy, Religion, Arts, Humanities to Modern Sciences. BHU Library system has more than 15 lac volumes of documents which include the following as per annual report 2013-14:

Table2. Collection @ BHU Library System

Document	Count
Books	10,60,269
Journals (Bound Vols.)	1,57,062
Current Journals	529
Online Journals	11893
E-Books	1,10,884
Theses	16,459
Manuscripts	7227
UN& Govt. Collections	35000 (approx)

4.2 Automation of BHU Library: In 1996, Central Library decided to automate its system to provide quick search facility to the users. At that time, CDS/ISIS is the only software which is of low cost, easily customizable, and promoted by government agencies. CDS/ISIS was installed in 1996 in BHU Central Library to create databases of theses and serials due to its capability mainly for maintaining small bibliographic databases. The database of 10000 theses and 2500 serials was created with the help of CDS/ISIS. In 2001, SOUL software developed by INFLIBNET was installed in the Sayaji Rao Gaekwad Central Library of Banaras Hindu University for creation of database of books, but due to some technical problems data entry work could not be started. After that, NewGenLib Software was installed in 2005 as commercial software which worked up to 2010. Again BHU Library acquired SOUL 2.0 software in 2012 for its library automation project.

5. SOUL 2.0

SOUL abbreviated for Software for Library Automation and Management, formerly known as Software for University Libraries, is integrated library management software developed by the INFLIBNET Centre, Ahmedabad. Formerly, two versions of ILMS (DOS and UNIX) were developed for university libraries in India. The package was first demonstrated in February 1999 during CALIBER- 99 at Nagpur. SOUL uses RDBMS on Windows NT operating system as backend to store and retrieve data. The latest version SOUL 2.0 adheres to most of the international standards used in the library management software. The SOUL has six modules i.e. Acquisition; Cataloguing; Circulation; Serials Control; OPAC and Administration. The modules have further been divided into sub-modules to take care of various functions normally handled by the university libraries. It is suitable for academic specially, university libraries, in the sense of its design and processes.

The features of SOUL are:
- Window-based user-friendly system with extensive help messages at affordable cost
- Multi-user software with no limitation for simultaneous access
- User-friendly OPAC with system allowing scalability to users
- Client-server architecture-based web access facility
- Uses RDBMS to organise data
- Supports bibliographic standards like CCF and AACR II and ISO 2709 for export & import facility
- Available in two versions – The university library version and the college library version

- Provides facility to create, view & print records in regional languages
- Supports LAN & WAN environment.

Lihitkar and Lihitkar during the ranking of selected library software package used in India for library automation concluded SOUL as ranked first in terms of features. The credibility of library software packages is evaluated on the basis of their salient features and the facilities available in the software. On the basis of the salient features, and the facilities provided, the software is ranked by giving points to each facility as per features. SOUL software scored first in rank (90 points) among all ten software products, followed by Libman (84 points) and LibSys (83 points) **(Lihitkar and Lihitkar, 2011)**.

Table3. Rating of major library software package *(Courtsey: Lihitkar and Lihitkar, 2011)*

Rating of major library software packages used in India

Sr No.	Software packages	Salient features	Acquisition	Circulation	OPAC	Serial control	Total	Rank
1.	DELPLUS	33	10	13	13	4	73	
2.	I-LIB	20	8	13	14	6	61	
3.	LIBMAN	31	10	17	20	6	84	II
4.	LibSys	37	11	14	18	3	83	III
5.	LIBTECH	33	10	16	14	6	79	
6.	SLIM 21	34	11	17	16	4	82	
7.	SLIM++	34	8	17	16	6	81	
8.	SOFTLIB	34	9	15	14	6	78	
9.	SOUL	36	11	18	19	6	90	I
	WOLK	33	8	17	14	4	76	
10.	SOFT TECH							

Soul is designed in view of Indian academic/University/ College library system while commercial software's are designed as general library management software hence it is more suitable for university and college libraries with minimum updates according to requirement. Soul is available in affordable cost than other commercial software. It provides more freedom to users for generating reports of their choice and format along with template and query parameters which is quite helpful for academic libraries.

5.1 Architecture: The fundamental architecture used for providing the services to the different libraries and users through SOUL software are as follows:
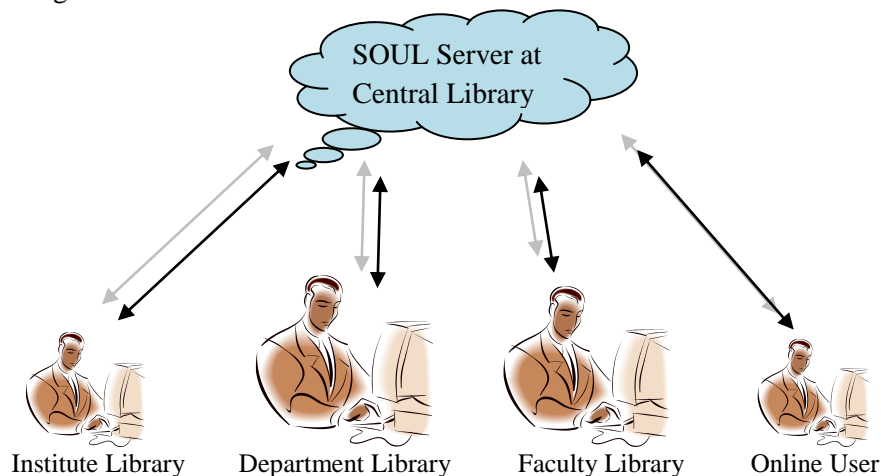

Fig2. Architecture of SOUL @ BHU Library system

The SOUL server is set and installed at the Computer Unit of the Central Library which provides the access to the institute libraries, department libraries, faculty libraries and users by setting the workstations as in Client–Server architecture. Client software is installed at each workstation which allows entering the records of documents, to modify the records, generation of reports, printing of barcode, printing of catalog cards, and circulation of the document. Users can access the OPAC from the central library and other libraries through the client-server architecture. Server saves the data of the different libraries in different database while it provides integrated search result which helps the user to know whether the document is available and what location it is. This integrated approach is of immense value for the user because it saves the time and manpower. The department library, institute library and faculty libraries have privileges only to open and alter the database of its particular library for different purposes. They cannot alter the data of other libraries while the Central Library staffs have only privileges to enter, maintain, and modify the data of the any libraries due to central processing of documents at university level. Table 4 describes the statistics of the libraries using SOUL in BHU Library System:

Table 4. Libraries using SOUL@BHU

Library	Number	Name
Institution library	04	Institute of Agricultural Sciences, Institute of Environmental Science and Sustainable Development, Mahila Maha Vidyalaya
Department Library	22	AIHC, Ceramic Engineering, Chemical Engineering, Chemistry, Computer Science, Electronics Engineering, Environmental Science, Geography, Geology, Geophysics, Hindi, Journalism, Law, Management, Mathematics, Metallurgical Engineering, Mining, Philosophy, Physics, Pharmaceutical Engineering, Zoology
Faculty library	05	Arts, Education, Management, Medical Sciences, Social Science
Others	04	BKB, CSEID, CWSD, Computer Centre,

5.2 Online Public Access Catalogue Module (OPAC): Cutter's objective which is published in his book "Rules for a Dictionary Catalogue" in 1876 is also relevant for online catalogue in the digital age. Keeping in the mind the cutter's objective, the objective of OPAC can be summarized as:

- To find, save and print the list of books of which the author or title or subject is known.
- To find, save and print what the library has by a given author, on a given subject or in a given kind of the literature.
- To show the machine readable catalogue (MARC)
- To provide the list of the books in the desired information exchange and display formats (e.g. Dublin Core, MARC21, MARCXML, Z39.50 etc.)
- To provide the different type search tools for catalogue search (e.g. simple search, advanced search, Boolean search, etc.)

OPAC and WebOPAC of SOUL software provides sophisticated choices of search options like simple search, advanced search, Boolean search, etc. and different display formats. It has provision of phonetic keyboard and multi-language search options. It also provides facilities of free text search for author, title and subject. It also enables the users to access various databases developed at INFLIBNET. Library can keep entire collection available at user's fingertips. This powerful, yet easy-to-use and user friendly searching tool allows user to quickly find the

materials in the library. SOUL increases the functionality of library's OPAC terminals by allowing the users to access the internal as well as external resources.

Some of the major features of SOUL OPAC (fig 3) are:

- SOUL includes Boolean operation when more than on e search option is to be used.
- Search results can be sorted according to the preference of search item.
- User has option to select variety of display formats.
- Display of records according to AACR-II format.
- Easy and quick searches with options.
- Status of each book starting from acquisition module is reflected.
- Search key fields, such as, author, title, keywords, class number, accession number, etc.
- Accessible through the GUI based web browsers like Netscape Communicator, Internet Explorer etc.
- User can see the status of currently borrowed items by entering his/her borrower number.
- Search results can be saved and printed.
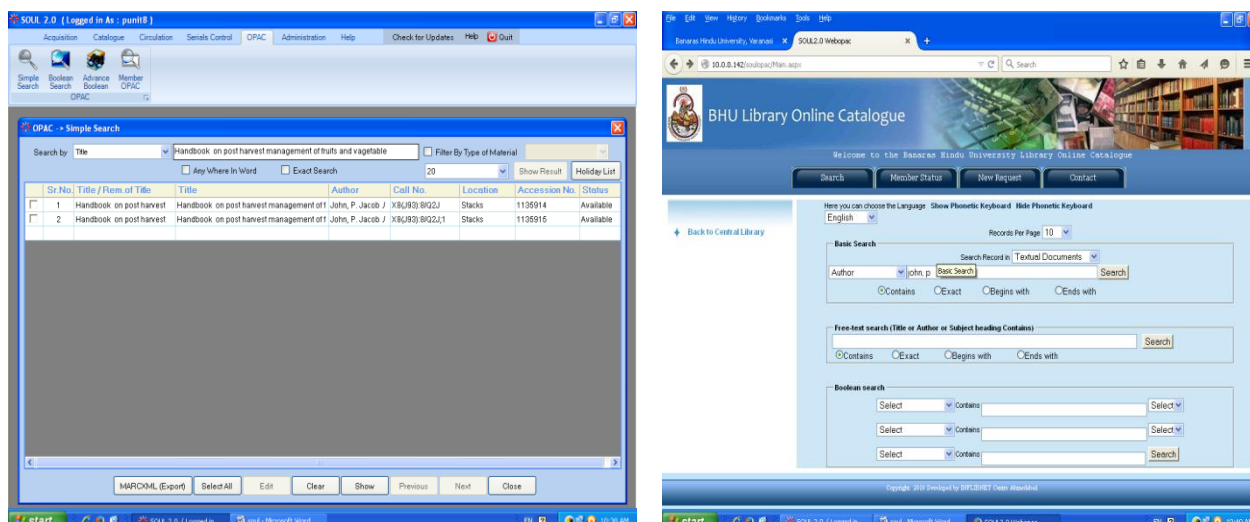- Selection of databases can be made according to the choice of users (Mohsin, 2013).

Fig 3. OPAC and WebOPAC @ BHU

6. SOUL 2.0 Catalogue Module

The Catalogue module is used for retrospective conversion of books; technical processing of books received from Acquisition Section, printing catalogue cards, printing a range of records for verification, searching by title and accession numbers, authority files for publishers etc. One of the unique features of SOUL is accessing to authority files on screen as well as selection box in various fields of records. This module covers the following areas of the library functions (see fig 4, 5, & 6):
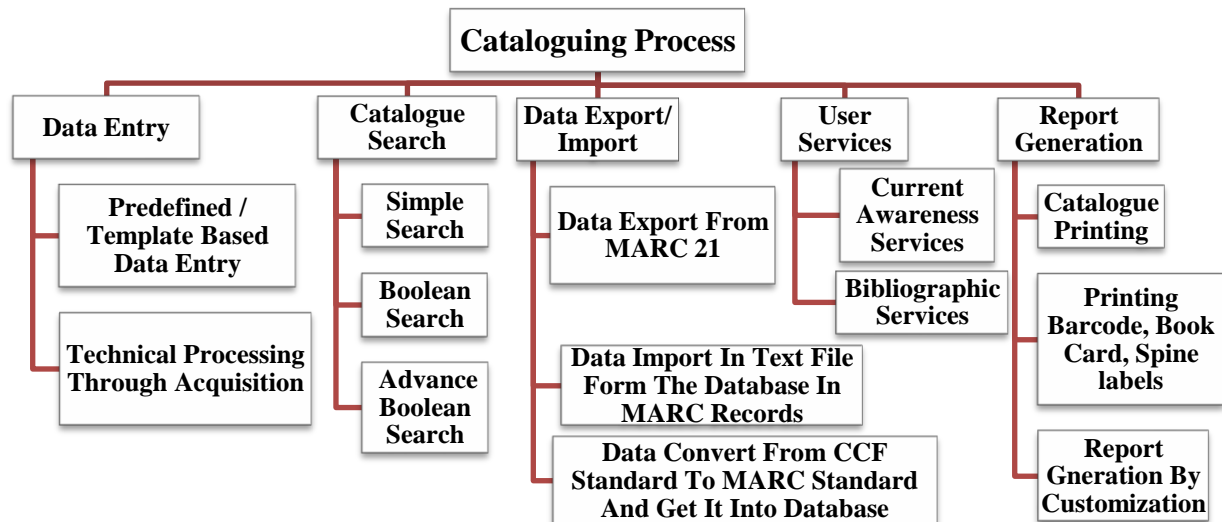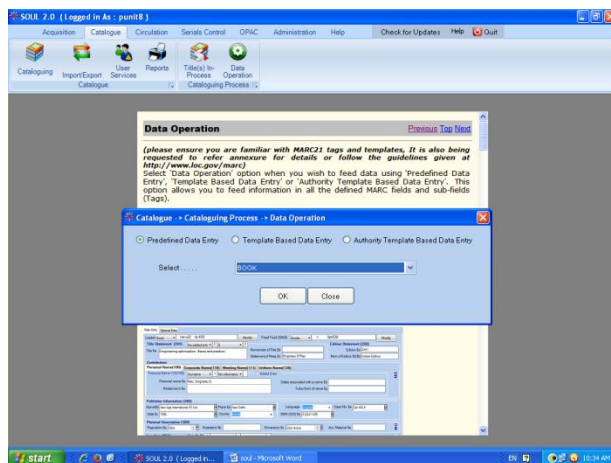
Fig 4. Catalogue Module of SOUL
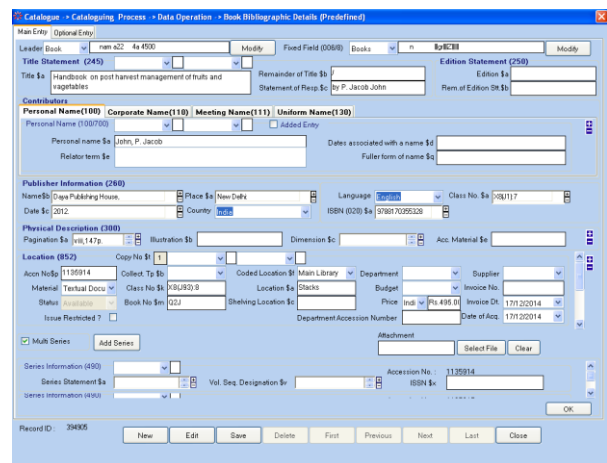

Fig 5. Catalogue Module of SOUL

Fig 6. Data Entry Sheet

6.1 Merits: The catalogue module of the SOUL has got various unique features, which are popular to its users, those are: easy to use and menu driven windows; inbuilt OPAC; provides user reports; evaluates staff performance; in-built barcode generation features, it does not require separate software and separate printer; provides Bibliographic and Current Awareness Services; prepares Catalogue card; display has got very unique feature of tag wise display, details display and catalogue card display; adheres to the CCF and MARC 21 bibliographic standards including the exchange of records in to ISO2709 format; accommodates record of different formats through export and import facility of the software; supports cataloguing of electronic documents, non book materials, theses and dissertations of various degrees including the magazines and the newspapers; facilitates stock verifications; maintains various authority files; and provides facility of catalogue anywhere through WebOPAC. Apart from those described feature, recently following new features have been added to the Catalogue module of the software, those are:

- **Unicode Based cataloguing of the document**: it gives facility to catalogue any kind of documents available at the library including non-book materials and electronic documents in any

languages available in the world. It is implemented based on the Unicode based multilingual feature available with the Operating Systems.

- **Full MARC 21 Support**: full features of the MARC21 have been implemented from the website of Library of Congress http://www.loc.gov/marc/.
- **Database Independent:** it is open for any database MSSQL, ORACLE or FOXPRO for this application.
- **Template Based Entry:** The module has default template prepared for cataloguing the various documents of the library collection. Most important feature of the module is that it provides platform to the users for creating their own templates based on their requirements of the fields to be entered. This can be prepared as many as user wants.
- **Supports ISO2709 format for data exchange**: data can be exported into ISO 2709 format and can be imported from ISO2709 format. It has feature of accepting data from CCF based ISO 2709 format.
- **Adoptability:** data transfer from old SOUL to new SOUL has been taken care with 100% data transfer.
- **Customized User Report:** The report of the catalogue module is empowered to the users. The user can generate report as per their choice. It is so simple that user can customize it as per the library requirement **(Vaghela et al, 2008)**.

6.2 Limitations: The catalogue module of the SOUL software has some limitations which can be illustrated as:

- **Problems with Barcode Label:** The barcode sub-module of the SOUL software does not support the thermal printers. Most of the thermal printers require special software for barcode generation while the barcode generated from Soul through DeskJet printers are not very effective; less durable; hard to scan correctly and complicated to print in copies. Since One A4 sheet of the barcode prints 20 to 28 labels of unique accession numbers so difficult to print for one book. BHU library uses special software (Bartender enterprise edition) to print the barcodes through thermal printers (fig 7.)

Fig 7. Barcode

- **Improper Rendering of Punctuation Marks:** In catalogue module of SOUL software, there is no need to provide the punctuation marks during the data entry of the documents because it takes punctuation marks automatically. But in case whether there is no subtitle of the book it does not provide the punctuation marks (/) in between the title proper and the statements of responsibility.
- **Improper Holding In Case Of Multi-Volume Books:** In catalogue module of SOUL software, there is no provision to provide the volume number to the corresponding accession number of the particular volume of the document due to no provision of the MARC tag. While searching in the OPAC, it is difficult to find the call number particular volume of the book.

- **Improper Rendering of Series Entry in Catalogue Card:** The series entry of the books in printed catalogue card is improperly rendered on notes area while it should be after the collation area.
- **Template Should Be Easily Customized:** Data sheet Templates customized by the user are not very effective due to its complexity. It can be simplified by hiding the unnecessary information from the data sheets.
- **Limited Copy Cataloguing:** The copy cataloguing provided in SOUL software is limited in some extent. The copying from another database requires lots of editing works which takes more times than normal entry while there is no provision for copying data within the database.

7. Further Developments

The catalogue module of the SOUL 2.0 requires following provisions:

7.1 Copy Cataloguing within database: In case of new edition of the already existing book, there should be made a separate entry of new edition of the book. There should be a provision to copy the data of the existing book to the new entry because in general the title, subtitle, authors, publishers etc. of the both books are the same. So there should be the provision of the copy cataloguing within the database.

7.2 m-OPAC: Paradigm shift towards mobile internet; user demand/ increase in use of mobile internet; to provide information search anywhere anytime; the best way to develop and build mobile presence; improper rendering of regular websites on mobile device; to target mobile audience; catalogue anywhere anytime; to avoid unnecessary clicking; for traffic free and fast information availability; faster download speed; improved search are the various reasons to develop mobile OPAC (m-OPAC) (Singh, 2014). The mobile OPAC should be concise, easy to downloads, and provide minimum but necessary information.

8. Conclusion

There is no doubt that library automation enhances the operations and services of the library. It shows automation can improve the library's relevance to the academic community. It further revealed that library staff enjoys working in an automated environment and the patrons enjoyed services rendered using an OPAC instead of a card catalogue. Library automation however requires adequate planning as well as availability of technical support **(Egunjobi, 2012).** Many challenges are faced by BHU Library during its automation project such as lack of expertise, delay in fixing the urgent issues by experts, frequent advancement in the technology, continuing upgrades of hardware and software, updated and standard software lacks provision for local variation generally used in traditional libraries, frequent power cut, staff unwillingness to new technology, staff anxiety for change of software, lack of proper training to staff, to apply new standards in old library, unsuitability of OPAC and its search result according to academic user's search strategy, etc. In spite of these, students, faculty and staffs are enjoying the facilities provided by library automation such as fast search of the holdings, correct location of the document, speed and accuracy in circulation due to implementation of barcode technology, catalogue anywhere through WebOPAC, etc.

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