Success Story of Migration of Library Data to KOHA Software: NCERT Experience

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Abstract

This paper discusses the importance of quality people, continuous professional development, and respect for institutional culture for success in library management. It focuses on the LDD, NCERT headquarters' success in migrating library data to KOHA: the O.S.S. as part of the change management process. The methodology involves understanding O.S.S parameters, conducting a feasibility study, and teaching library staff about MARC 21 and KOHA compatibility. The KOHA schema is self-explanatory, and a blueprint and road-map are developed to help library professionals work in their libraries using software in-house. The process was completed in-house without outsourcing and meeting deadlines, with functional cataloguing and circulation modules.
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Keywords
O.S.S.;KOHA; LDD; Change management; Blue print; MARC21

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1.0 Introduction

In order to have a fulfilling life, we need to develop a blueprint. We have to establish goal with a sense of purpose and generate new ideas which can bring success. Same happens in the organisations and institutions. In order to achieve the war, we have to win many battles. We have to develop action points including what we want to achieve and what is the dateline for the purpose. In order to begin the project, we need total quality people. Attitude contributes to success. When employees say," I cannot do it"—there are two possible meanings. Either they don't know how to work or they know the local situation from compatibility point of view. If they don't know, it is a training issue. Three factors determine our attitudes i.e. Environment, Experience and Education. All of these create a culture. In a positive environment a marginal performer's output goes up and in a negative environment, a good performer gets academically arrested. It is tough to expect positive behavior in a negative environment. Our behavior usually changes according to our experience. When we talk about academic qualification or education- it means education provides wisdom, which ensures success. We are drowning with information and starving for knowledge and wisdom. People with positive attitude need to be confident, work with patience and humble.

We need to learn for knowledge and wisdom. Learning is to "learn to learn". We have to continuously sharpen the axe. A winner makes commitment.Winners have dreams for implementation following proper SOP (Standardised Operating Procedure).Winners plan and prepare to win plan through action plans for success. "Success is the progressive realization of a worthy goal" --Earl Nightingale [(2)] Success is a journey to achieve the goal not a quest. After we reach one goal, we go on to the next. Realization means, it is an experience. Worthy refers to our value system. Worthiness determines the quality of the journey. Goals are important as they give us a sense of direction. Success is the manifestation of inspiration, aspiration, desperation and perspiration in a sequence[(1)]. No plan, lack of formalized goals, lack of focus, giving up vision, doing too much alone without involving the team, lack of training, lack of persistence, lack of priorities and imitating others are the obstacles for success. Obstacles are there and we have to struggle for it. There is an English proverb, "A smooth sea never made a skillful mariner". We have to win small battles and celebrate those. Success is not measured

by our posts, that we are holding. Failure is the pillar of success. It is measured by how many times we have failed to achieve and what is the reason of bouncing back. We observe that, every success story is the story of failure. The successful people don't do different things. They do in a different manner on the basis of their education, experience and thinking process. Ability to think is very important while developing the blue-print.

Sometimes unthinkable things happen and everything turns upside down. Bad things happen to good people. It takes both rain and sunshine to create rainbow.The team leaders are like rain and the team members are like sunshine to continue in achieving goal and hence developing the rainbow.Desire, commitment, responsibility, hard work, character, positive belief, power of persistence is important for the leader. Finally acting as a teacherto explore the hidden treasure amongst the team members helps in success. Unwilling to take risks, lack of persistence, looking shortcuts, selfishness, lack of understanding of nature's law i.e."All progress is change, but all change is not progress", are the obstacles for success. We have to evaluate it respecting law of cause and effect. "Birds of the same feather flock together"-comes true when we think a plan, act upon that, face bounce back situations, solve problems to reach the goal. Preparation leads to confidence.It islearning from our mistakes.When we do mistakes, we should admit quickly, learn from it, should not repeat. We should have a plan, plan of action, preparation, patience, practice (5Ps) [(1)] towards excellence and "Can do" attitude. Fear, lack of confidence, procrastination destroys our potential and ability [(1)]. Escape puts us in comfort zone. If you are on the driver's seat, should get rid of fear and try to use talent of the team members. Discipline is one of the vital parameters of success. The team members need to know, where they stand knowledge-wise. Knowledge helps usto reach thedestination. We should know the goal.We should focus on what we have not on what we don't have.Desires become strong when they are supported by direction, dedication, determination, discipline, deadlines [(1)] (5Ds). Our life is like a wheel with six spokes-families and their financial, physical, mental, social, and spiritual conditions. If anyone is out of line, our life goes out of balance. When our value system is clear, it becomes a lot easier to make decisions and commitments. We owe loyalties to values. "I stand by you" to the team members reflect the value of the leader. Values and ethics are designed for both good and bad times. Situational ethics varies with the situation. The aforesaid points are applicable everywhere including success in individual life or success in institutions/ organisations. The library is also treated as one of the important divisions of the parent institution. Finally, we have to keep in mind that success has many fathers and failure has none.

2.0General principles of library management:

The general principles of management in libraries are: Division of work: The work is divided according to post &specialization; Authority and responsibility: Both authority and responsibility goes together; Discipline; Unity of command: "One Boss" is the motto of the principle; Unity of direction: "One Plan-one direction" in achieving the goal; Subordination of individual interest to general interest; Scalar chain management; Equity; Staff retention;Initiatives; and finally Importance of team work should be felt.

In order to bring transformation in libraries, the librarian acts as the master thinker and follows management techniques, common to all the libraries, which are-

1. "Financial management(cost-benefit analysis);
2. Budgeting(zero-based budgeting);
3. Change management(Automation &digitization);
4. Human relations(Understanding the needs of the staff and customers);
5. Human resource management(Staff management);
6. Job analysis,evaluation,description through duty chart;
7. Management by Objectives(Formulation and achieving the goals);
8. Management and Information system(Decision making);
9. Marketing(Understanding the community and customize their services);
10. Motion time study(To improve procedure in library activities and services);
11. Operations research(Designing information services and analyzing user behavior for document delivery);
12. SWOT analysis(For customer satisfaction);
13. System analysis(Analysis of different sections for reforms);
14. TQM (for customer satisfaction);

15. Participative management(Regular meeting with staff);
16. Carryout Research-cum-development related work;
17. Collaboration with libraries" [5].

2.0 Change management in libraries

The library management usually takes place keeping in mind the general principles of library management mentioned on the aforesaid paragraph. The progressive librarians think of total quality management and apply the management ideas drawn through osmosis process and applicable in library administration excelling the library services. Change management is always leader-driven. Change management process is the combination of expert driven and team driven approach. It is always top to bottom approach. Now-a-days keeping in mind the need of digital delivery of services and financial constraints, the leaders prefer the use of Open Source Software.The feasibility study has to be taken on priority basis before use, which helps in assessing the need for change, purpose for change, action plan for change and how to implement change for sustainability. Change is a costly affair and it needs to be taken care of thoughtfully, if the change is required. In order to go for change in the use of software, the leader has to follow a model to avoid mistakes andto provide a sustainable outcome. In case of Library professionals, the theory taught in the class, workflow of the organisation along with local variation needs to be taken care of. Scheme of classification followed, cataloguing rules followed, Indian standards developed / adopted/ followed should be the part of the feasibility/ compatibility study to understand the compatibility of the O.S.S. Understanding the past also helps to envision the future.

3.0 Golden Rules of Migration[3]

Most of the libraries are automated since late 19th century using proprietary software- may be commercial or developed by the institute. Due to access to open source software and the library professionals having IT knowledge, theyafter streamlining the housekeeping operations, services, information literacy programs and reach at a required height, wish to operate through free open source softwares. And that's the reason; need to have a change management. At the first chance they try in the field of automation. In order to achieve the migration of data, they follow few things to meet the objectives.

a) They require to know the situation of their libraries and hence need of situational analysis, as "Bad start-up data is a curse of many good projects".[3]
b) They carry- out meetings in- house to discuss the roadmap as the real project had scores of legacy data and the new system has hundreds of tables.
c) At the initial stage, they try to retain the experienced professional staff and explore their inner strengths.
d) Accordingly, they are assigned the duties to import the best to achieve the set goal.
e) They retain the legacy data and understand how to clean it. They take care of the hardware requirements and their up gradation compatible to KOHA.
f) They conduct workshops on installation, customization of different modules of the software as per the workflow of their libraries.
g) They don't fire-fight for data errors. They go for the feasibility study and explore the tools for migration
h) They train the staff about the tools like: AACR 2/2R rules, scheme of classification i.e., use of uniform edition, Z39.50 compatibility, ASCII, Standards, SLSH, LCSH, OCLC, MARC 21 tags, coding, algorithms.
i) Very often data migration begins with technology and ends in disaster, as it is a technical issue [3].
j) After refreshing about the tools, they plan for migration module- wise after knowing the data items.
k) Data validation is the essential step. Here we may face new bugs [2].

l) The coding needs to be handled by the technical staff.

m) They provide a solution before we understand a problem.

n) They have to compromise with data quality from the beginning.

o) Data source owner and data store owner should be identified [3].
p) Power should not be divorced from authority.
q) Data stake-holders should be from the subject domain.
r) Subject domain experts should not be out-sourced, as they have a vital role.
s) Data transitional rules should be framed.
t) We must keep in mind that, the process is not a journey but a quest.
u) We should build data, test it and should go live for sustainability
v) At the first instance both the database should be maintained in a parallel manner.
w) Old system retirement policy should be framed [3].

4.0 MARC 21 Record:

The bibliographic description of a document includes all the data elements necessary to uniquely identify the resource, along with access points based on ISBD (International Standard for Bibliographic Descriptions).AACR2 provides rules for describing items in a catalogue card record, whereas MARC is a communication standard and provides framework for catalogue record[7].MARC format is used for entering records into an online catalogue. This enables to import records from LoC "Or" OCLC.

The MARC record is divided into three elements:

- Record structure (Format for information based on ISO 2709).
- Content designation (Set of symbols by which data in the record are identified and manipulated).
- Data content of the record: Record specific information. This is based on external standards such as: ISBD, AACR 2 or other cataloguing rules, LCSH, Subject thesauri and scheme of classification are used by the institution's library.

  MARC record comprises of:
  - Leader (Tag)
  - Directory
- Data content

  Here the policy of "one size fits all" does not apply. The librarian has to customize; as per the local needs.

MARC-21[7]

Tag	Description	Indicator	Subfield	Data
020	ISBN	##	$a	$a…….
022	ISSN	##	$a	$a…….
082	Call no.	00	$a	$a…….
100	Main Entry (Person)	1#	$a	$a Surname, Forename
245	Title	00	$a $b $c	$a Title: $b Subtitle / $c Statement of responsibility
250	Edition	##	$a	$a…….
260	Imprint/ Publication	##	$a $b $c	$a Place: $b Publisher, $c Year.
300	Physical Description	##	$a $b $c	$a Pre, Main pages: $b Illustration; $c Size.
500	Note	##	$a	$a…….
505	Formatted contents	0#	$a	$a…….
650	Subject headings	#7	$a	$a…….
700	Added entry person	1#	$a	$a…….
740	Uncontrolled format	##	$a	$a…….
830	Added entry series	-x/#0	$a	$a…….
900	Accession No.	##	$a	$a…….

5.0 Ready for migration

1. In the first stage of migration, we create a detail program for various stage of migration.
2. The legacy data is to be kept safe (Create a Copy of Legacy data to perform action according to our need and keep an original legacy file for future use)

3. Top to bottom advisory need to be noted carefully- if there is a mention of migration of library data to KOHA-the OSS.
4. The feasibility study of the softwareand hardware is required and it through R&D.
5. The situational analysis with respect to staff skill and IT infrastructure need to be studied.
6. Once the situational analysis and feasibility study is over the leader has to develop the roadmap.

6.0 KOHA:

KOHA library software is the world's first free and open-source library software [(6)]. The latest version is 23.11. It has a MARC flavor. In order to install KOHA, certain requirements are there, which are mentioned below both from infrastructure and technical point of view.

Infrastructure:

1. LINUX server
2. Apache
3. Maria DB/MYSQL(Database)
4. Perl (language used to develop Koha ILM software)
5. Ubuntu operating system or DebianOS (Choose OS according to release versions)
6. Zebrahelps in developing index and acts as a search engine[(4)]
7. MARC editor (For Excel to MARC file data conversion and field tagging according MARC Tag)
8. Static IP address(For Local server access or access to WEB OPAC)
9. Desk tops with internet connectivity (For Local area Network connection)
10. Legacy data [(3)]
11. Cloud space for storage(for Installing of Koha on cloud and access via cloud. It is not required for Local installation or access)
12. GNU License: GNU General Public License is a series of widely used free software license or copy left that guarantee end users the four freedoms to run, study, share and modify. Each file must include GPL V3 license at the top [(2)]

Technical:

1) Stable version
2) Codename
3) KOHA version compatible to Debian package version
4) Coding
5) Default: E-mail is turned off we have to turn on [(6)].
6) Create an entry in Bugzilla to change patch. It usually depends on the workflow of the different sections of the library.
7) Copy right (c) year with your name- or your employer's name. As KOHA is free software, we can redistribute and modify it [(6)].
8) Bugs: Contributors to KOHA must provide reference to a bug number.
9) Terminology: Agreed set of library terms must be used.
10) CSRF Protection (Cross Site Request Forgery) [(6)].
11) KOHA Manual has to be followed

7.0 Parameters to develop the blue-print

Keeping in mind the general principles of library management and mantras for success mentioned earlier, the blue-print is developed as the part of the action point for change management. The blue-print includes the following:

1. Total Quality People,
2. Sharpen the axe [(1)],so that the staff get trained,
3. Make the staff aware of the institutional culture and how to use their education and experience,
4. Improve the environment to improve the work culture,
5. Learn to learn,
6. Make the situational analysis,
7. Understand the past to envision the future[(5)],
8. Set goal,
9. List out the bounce-back situations,
10. List out the tools to be used,
11. Choose your plate in the cafeteria on the basis of the available resources(Human Resources, Financial Resources and Technological resources),
12. Develop "Can Do" attitude among the team members,

13. Evaluate and celebrate small achievements,
14. Gather small achievements for the win-win situation,
15. Finally, you feel that you have reformed to perform and got transformation. So, inform the authority about the success story.

9.0 Road map for migration to KOHA: the OSS

a)The legacy data is to be kept aside securely,
b)Top to bottom advisory needs to be noted carefully if there is a mention of migration of library data to KOHA: the O.S.S.
c)The feasibility study of the software needs to be done through R & D.
d) Situational analysis with respect to staff skill and IT infrastructure need to be studied.
e)Once both feasibility study and situational analysis is over, the librarian has to develop the road- map, which is otherwise known as the blue- print. The blue- print should include the following.

(i) Stableversion of KOHA (Latest)
(ii) Compatible LTS (Long Term Support) version of UBUNTU to that of KOHA version.
(iii) Understand the work- flow of different house- keeping operations.
(iv) Understand the scheme of classification, cataloging code followed by the library.
(v) Understand the authority file, in the absence of which develop the authority file. The authority file will include the scheme of classification along with edition, the cataloging code followed and the need of main Entry/ Shelf list card (manual) for future reference, the method of derivation of subject headings through SLSH(Sear's List of Subject Heading), if following DDC scheme of classification in order to make the subject headings uniform.
(vi) Train the staff about the DDC, AACR-2, and SLSH and find out the work-flow to refresh the staff memory and to bring transparency.
(vii) Seek the help of IT division for infrastructure, coding, programming, installing of KOHA and other peripheral O.S.S. to fulfill the objectives.
(viii) Decide the stable software and install that after installing UBUNTU.
(ix) Once the software is installed, install the MARC editor: the tool for migration (4)(Excel sheet data to .mrk file)
(x) Once the installation part is over and the standard workflow is developed; the customization needs to be completed with the help of the MARC-21 tags.
(xi) Usually it is seen that, in older libraries, the data in source format i.e., Bibliographic data and patron data is available in various formats. Therefore, the existing data is placed in MS Excel sheets for processing of data(4).
(xii) The excel sheet is developed with columns and rows in order to accommodate all the fields/ Subfields to map the data.
(xiii) Algorithm is a set of instructions to perform computation. It helps in removing errors, removing blanks for merging multi row records/ same records (2).
(xiv) For data transfer, we are using MARC 21 library standard, which include various tags. We need to understand the type of resources, and their bibliographic descriptions and finalise the tag. For example: The descriptions for books are different from journals and different from cartographic items as well as audio- video CDs and so on.
(xv) Once the MARC tags are finalized and excel sheet is ready, data mapping starts. Here, the fields in the final excel sheet obtained are mapped with MARC tags. MARC has become the international standard communication format, developed by UNESCO. MARC 21 is the popular standard exchange format, which adheres to ISO 2709(10).
(xvi) ISO 2709- IFLA: Is an ISO standard for bibliographic descriptions titled information and documentation format for information exchange. The ANSI(American National Standards Institute)/ NISO(National Information Standards Organisation)American counterpart uses Z39.2-1994(R2016),

information interchange format, to efficiently compress and exchange MARC data. All are fundamentally compliant with the core standard (12).

(xvii)The ISO 2709 provides a small number of mandatory data elements, which are recognized by all sectors of the information community. It also provides a mechanism for linking records and segments of records.

(xviii) Z39.50 is an international standard client- server application layer communications protocol for searching and retrieving information from a database over TCP/IP computer network. It is a search engine to search from LC library. It's used for searching retrieving and copy cataloging for library material through ISBN, ISSN, Title and author etc.(11)

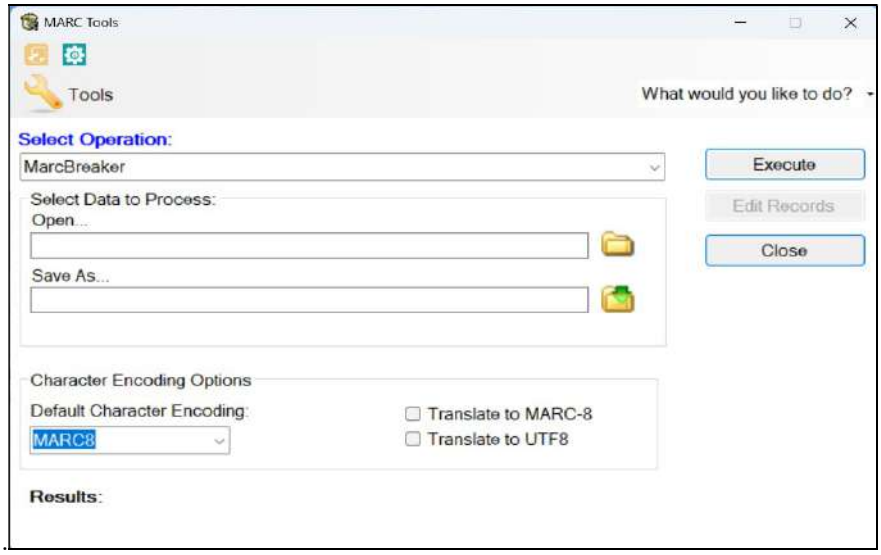
(xix) Dublin Core: Dublin core is also known as Dublin core Metadata element set. It's a set of 15 main metadata items for describing physical or digital resources. It was the first metadata standard for describing web content.
(Title, creator, subject, description, publisher, contributor, data type, format, identifier, source, language, relation, coverage, rights)
Dublin core is not meant to replicate MARC (14).

(xx) MARC Record: - MARC format record is developed for books, periodicals, audio/ video CDs, cartographic materials and other resources available in the library during customization.Components of MARC record:

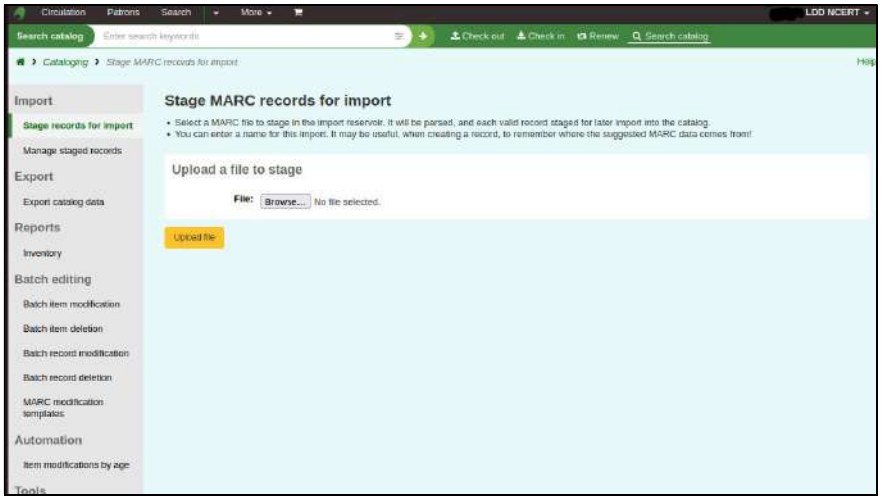
Leader, Directory, Variable fields

Control field Data field

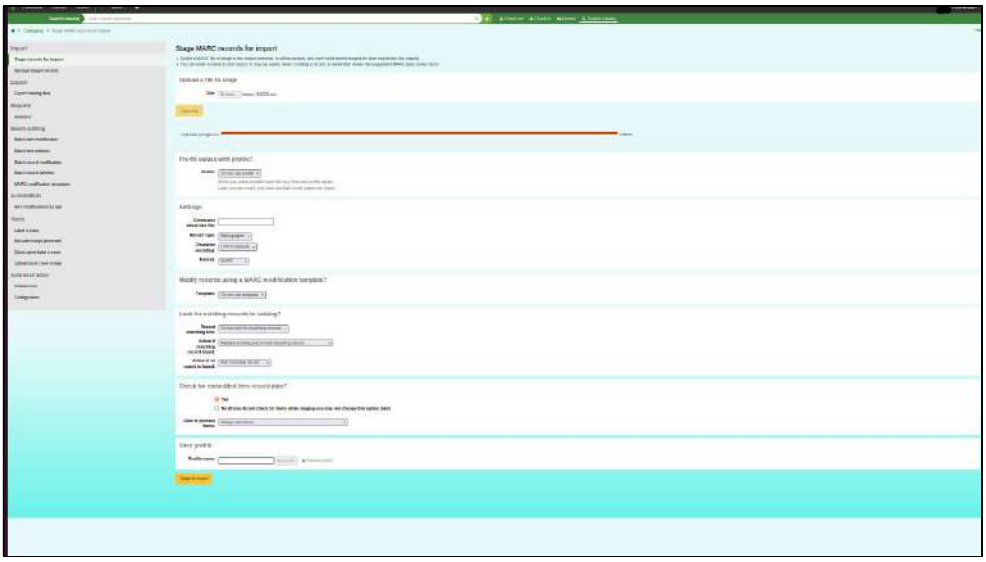
xxi) The data in the excel sheet is converted to .mrk file through MARK editor. Then .mrk file is converted to .mrc file as an output file



(i) Upload .mrc file



(ii) Import batch into catalogue



(iii) Rebuild zebra for indexing purpose

(iv) Rebuilding zebra updates MYSQL database [4]

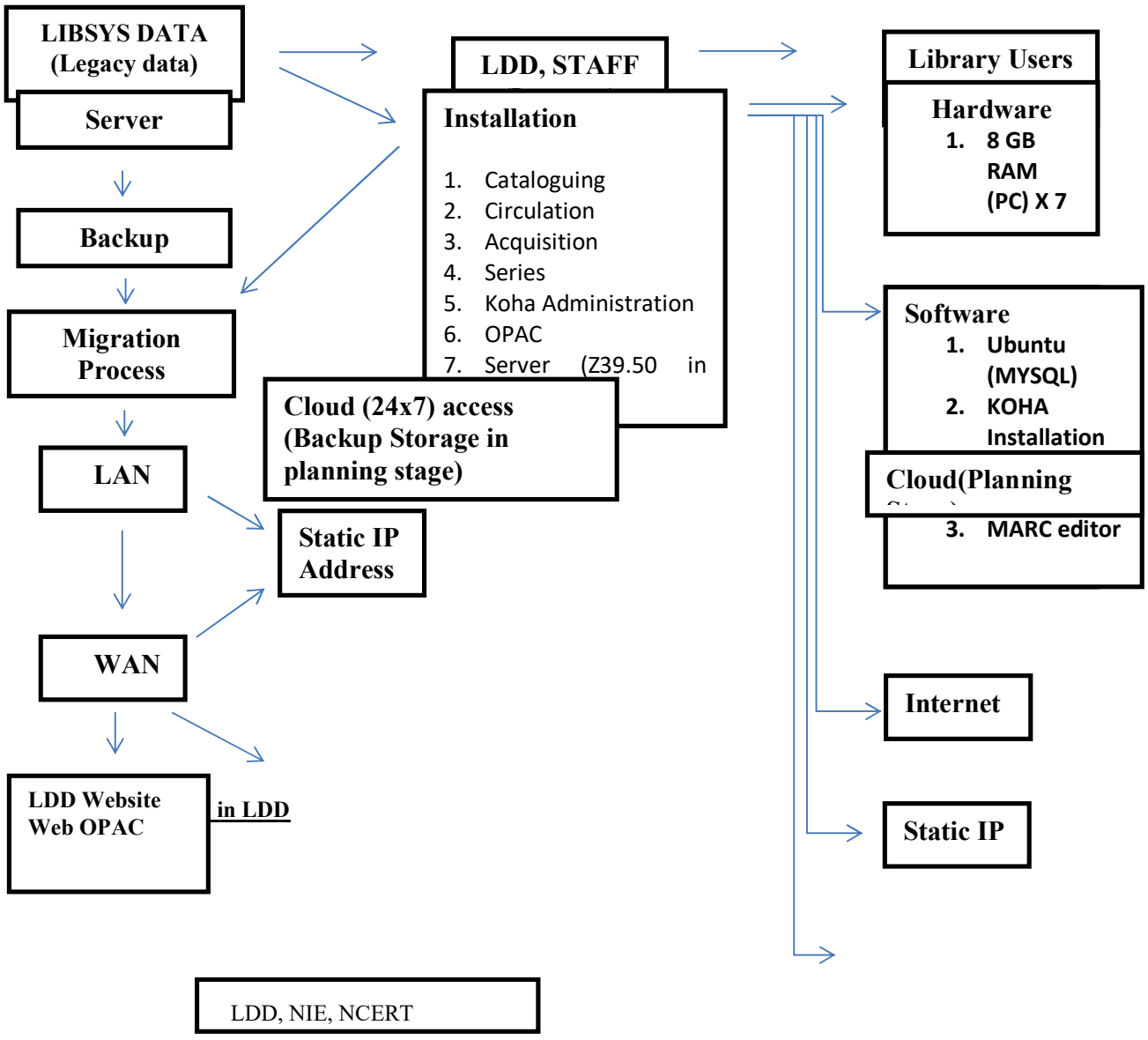
(v) Data Validation: Data validation is the process of ensuring data quality. Data quality problems arise during data entry level or development of database scheme level. At data- entry level, spelling mistakes, non-use of proper Main Entry as per AACR-2, borrowing class number from OCLC database and not verifying from DDC, importing subject heading from LCSH instead of SLSH, and not maintaining uniformity leads to data error. AACR2/ AACR 2R; DDC (Uniform edition- use of), Z 39.50 Compatibility, customizing the software as per the institutional

workflow, using stable version of the software, use of peripheral O.S.S. software compatible to the stable version of KOHA software well conversant with the required version. Identification and removal of bug is very important for sustainability in O.S.S. Change is inevitable and in order to accommodate and adopt the change for sustainability, involvement of IT professional in the team is very important, failing which sustainability may be doubtful. During data conversion, some of the records get lost in part or full due to unstructured output from the source file & absence of the key datafield [(4)].

10.0Use of KOHA: LDD experience

1. Ubuntu 22.04.4 LTS Operating System was chosen.
2. KOHA stable version (23.05) was chosen.
3. KOHA with MYSQL got installed in one of the P.C.
4. The default and customized setting was configured.
5. Legacy data was not in MARC format, for which change to MARC format was needed.
6. Static IP address was used to access web interface of Koha ILMS by client user for access and insert record in software.
7. Apache HTTP Server Project is an effort to develop and maintain an open-source HTTP server for modern operating systems.
8. The host, user id and password were set up.
9. The web interface was accessed to develop the public interface and staff interface,
10. Algorithm was set understanding the workflow of the library in different sections, as per KOHA modules.An algorithm includes a finite number of steps for problem solving.
11. List of commands are provided by the Debian package, known as Debian GNU/ LINUX it uses LINUX Operating System.Maria DB is default MySQL server.
12. Elastic search is possible instead of zebra search. Zebra software helps in creating and printing cards, integrate card printing. Zebra tool provides durability, comfort, innovation and technology as a search engine. MYSQL and Maria DB are both open- source database technologies. We use them to store data in tabular format with rows and columns. MYSQL is the most widely adopted open- source database. Maria DB is a modified version of MYSQL. Maria DB adopts MYSQL's data and table definition files and also uses identical client protocols, parts and sockets. MYSQL is a relational database management system. There are similarities in both. MYSQL has fully open source version released under GPL[(6)].
13. We have to change the code as and when required.
14. The set of commands need to be remembered by the library staff.
15. Coding guidelines is very important factor: Coding guidelines were used for indentation, formatting. It provides consistent formatting.
16. Errors may occur. To solve, developer's handbook was followed for development of work-flow, version control, coding guidelines, Debian package, dashboards, schema and so on
17. The Koha version can be upgraded after installation of new Perl module[(6)].

11.0KOHA Schema at LDD, NIE, NCERT



LDD, NIE, NCERT

Bibliographic data (Legacy data)

↓

Data in Excel Sheet

↓

Data Mapping (By creating Marcfile)

↓

(MARC Editor tool) Create mark. Extension file. (.mrk)

↓

Mapping to MARC tags

↓

Create machine readable cataloging (.mre file) (.mrk to .mrc)

↓

Store .mrc file

↓

Data migration to KOHA

↓

For migration go to cataloging option and select import marc file

↓

Upload .mrc file

↓

Browse and upload .mrc file created by you

↓

Stage records

↓

Manage staged records

↓

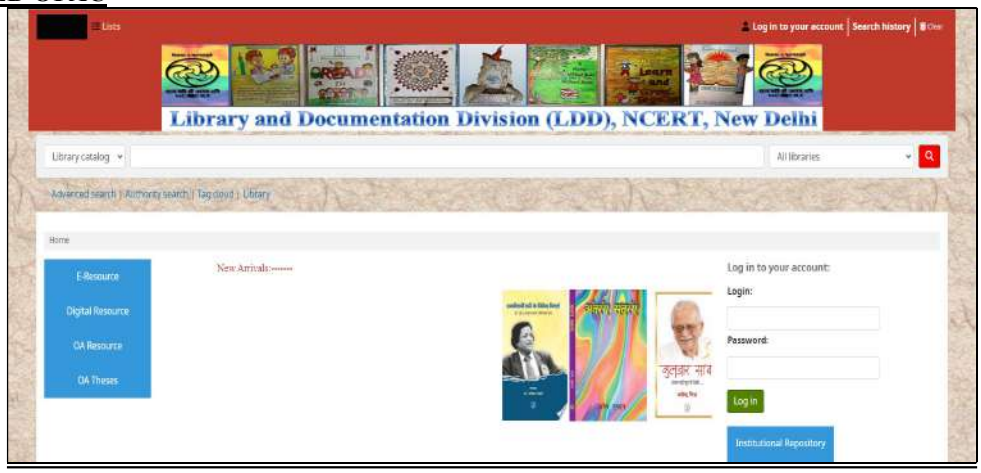
Import batch into catalogue

↓

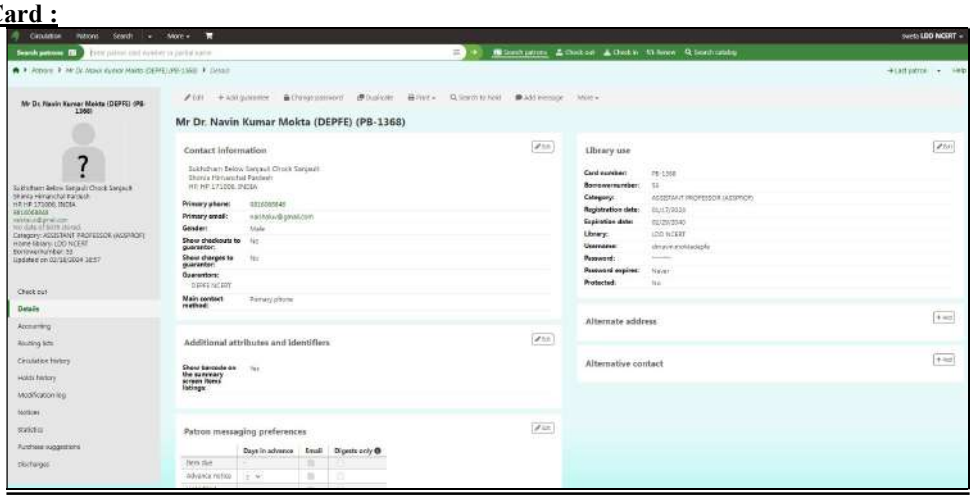
KOHA database in MYSQL

13.0 Screenshots

OPAC/WEB-OPAC



Reader's Card :



14.0 Conclusion:

The FOSS should not be used for fashion/ interest that will not last long, but should be used for sustainability. Keeping in mind the available skilled human resources and their management is crucial for success. The success story of LDD, NIE, NCERT, New Delhi in migrating the library database could be possible within the deadline because of the total quality people in the team. The team leader taught about the institutional culture and took care of the 3Es in the work place. When we compare the migration process between journey and quest, it seems like a quest. After following the road map it seemed like a journey. The parameters to develop the blue-print helped in bringing transformation. The migration process started after understanding the past to envision the future. The need and purpose for the change management was realized and with the help of the road map the implementation was possible. As change is a costly affair through consultancy services, the cost benefit analysis produced a good Return on Investment (RoI) by completing the job in-house. The technological compatibility was taken care of by the IT professional, which helped us in installing the peripheral soft-wares for use of KOHA (stable version).While installing KOHA, we faced problems like pen-drive corrupt/Boot sector corrupt/errors due to GRUB file too. In the event of use of DDC scheme of classification and AACR2 cataloguing, SLSH was used for subject heading to maintain uniformity. Use of Z39.50, MARC21 tags, ISO 2709 standard for bibliographic description could help in information exchange and mapping of legacy data. Rebuilding zebra software helped in uploading the MYSQL database. Data validation and identification of bugs is a herculean task for the professionals. The society underestimates the library professionals without exploring the knowledge, wisdom and skill within them. The success story only informs the transformation. However, the collaborative effort of the IT staff cannot be ignored. The bounce back situations have brought the success in migrating to KOHA software. MARC flavor in KOHA plays the vital role for the implementation of the project. The goal could be achieved due to the proper direction, dedication, determination, discipline and deadline (5Ds) set on the blue print. It may be mentioned that, the above 5Ds can be possible when six spokes of the staff-life is taken care of by the team leader to motivate them. Use of FOSS is an easy task, when we board IT professional in the team. However we have to work continuously for sustainability.

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