
Understand the Past to Envision the Future: Migration to O.S.S. –from A Practitioner’s Perspective

Moortimatee Samantaray

Deputy Librarian

LDD,NIE,NCERT

Sri Aurobindo Marg, New Delhi-16

Email:murtimati.rath@gmail.com

Abstract

This article discusses the systematic migration from proprietary software to open source ILMS-KOHA, a process that involves understanding the past, planning for the future, and conducting a feasibility study. The author emphasizes the importance of understanding housekeeping operations before and after automation, developing operational feasibility roadmaps, retiring from existing software, re-architecting, and retaining data for sustainability. Data validation is crucial to ensure data quality and accuracy, and the process should be completed after data migration.

Keywords

Migration; KOHA; technical feasibility; economic feasibility; legal feasibility; data validation; O.S.S.

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1.0 Introduction

Software migration is the process of moving data from an old system to a new one. It happens while upgrading or switching over to a new platform. Migration can be of three types.

- a) Storage migration (Relocating the data)
- b) Cloud migration (Moving data from on demand server to cloud)
- c) Application migration (Moving application software to a new system)

Application software is a set of one or more programs designed to do a specific task such as: procurement of books, scientific processing of resources for dissemination, processing of journals for use, issue/return of books and making it available for development of information products. Computer system comprises of both hardware and software. Hardware is controlled by the software. Software is a set of instructions called a program. Instruction need to be written in proper sequence. Software is classified as proprietary and O.S.S. Open source software describes the principles and methodologies to promote open access to the product and design process for various reasons. The term is commonly applied to the source code of software that is made available to the general public without IPR restrictions.

When any job or task is written or described in a sequence of steps in plain English language, it is called an algorithm. As a computer is a machine and does not have a brain, we need to instruct it from where to start and where to end. Pictorial representation of these steps is known as a flow-chart. The flow-chart uses a particular set of symbols. In LDD such steps can be derived from the Result Framework Document of different sections. Programming language consists of machine language, assembly language, high level language. Once the algorithm and flow-chart is ready for particular software, it has to be written in computer coded language of only 0s and 1s. These are known as binary languages i.e. Machine language. As it is very difficult to generate code in machine language the assembly language was developed, which consisted of small meaningful terms. This is the second generation computer. Third generation languages include C, PASCAL, COBOL, FORTRAN & BASIC. A high level source program must be translated to machine language by software called a compiler. The programmer needs to specify what is wanted for files and databases. Once we

know about the workflow, programming, it is essential to know about standardization. Standardization plays an important role in every sphere of our day to day life. Standardization is the process of agreeing on technical specification of any process or product. The goals of standardization are: to have compatibility, safety, reparability and quality. We all know about internet, intranet, Server, WAN, MAN, LAN, URL, Switch, Router, LAN Card, IP address, CCF, interoperability, data backup, tags of MARC 21 and so on. Technical terms are to be understood by everyone. Technology has a role, but the key player in the business is important. Here, business means the knowledge on AACR-2, how to make a catalogue entry for different types of resources, assigning the call number according to the scheme of classification followed, and the use of Sear’s list of Subject Heading (SLSH). If the scheme of classification used is D.D.C, knowledge on sought link and unsought link is needed. Once the professional staff has basic knowledge on types of resource and their cataloguing, deriving the class number, assigning the book number and collection number, keeping in mind the local classification scheme, the user profile is kept is created and the subject headings are derived. With this, the business part is over and the data entry is made in the computerized system. Professional knowledge helps in development of quality data. Quality data should include the products delivered in the past.

2.0 Glorious days of DLDI

The DLDI continues to support the research and development activities of the various constituent units of the NCERT and research scholars from all over the country and abroad. The DLDI has rich collections of books and periodicals in the field of education in general and school education in particular. The Department established

IERDoC (International Educational Resources Documentation Centre) and POPDOC (Population education documentation Centre). In 1993-94, the DLDI had more than one lakh purchased books and more than 20,000 gifted books, 272 periodicals were being subscribed and 52 periodicals were being received though gratis for dissemination besides magazines and newspapers.

The documentation and reprographic services are being provided as per the readers’ needs and in anticipation demand too. The information products like accession list, current contents, article indexing, bibliographies, Book reviews and press clippings are

being released. The photocopies are provided in lakhs of pages to the readers. The extended hour service is being provided to the readers of Delhi and NCR. As per the annual report of NCERT, the DLDI was in the process of creating computerized database. As a result, the DLDI became the member of DELNET and MoU was signed with NISSAT.

NISSAT (National Information System in Science and Technology) established in 1977, aiming at linking and coordinating information sources, information systems and services available in India. As a result, in 1988 DELNET became the first operational library network in India. The DLDI became the member of DELNET in the first phase. NCERT got MoU (Memorandum of Understanding) signed with UNESCO. As the part of the MoU, the DLDI procured CDS/ISIS software for information storage and retrieval systems developed, maintained and disseminated by UNESCO. The Major features of the software include: handling of variable length records, fields and sub-fields, handling of repeatable fields, information retrieval using powerful search language, free text searching, and data interchange using ISO 2709. CDS/ISIS for windows came into existence in 1995. The DLDI started entering library data, i.e. bibliographic records, in CDS/ISIS during 1995 onwards.

Annual Report of 1997-98 at p. 119 authenticates that, Data entry for preparation of database for the library of the NCERT was the job, undertaken by Computer Resource Centre of NIE. The annual report of NCERT (2000-2001 at p26) mentions that, “NCERT in collaboration with European commission is implementing the plan for automation, collection, library service development, staff development, management and to transfer the NCERT library system to a National Resource Centre of Education...”. European commission funded for the modernization of DLDI and constituent libraries. In the first phase, all the constituent libraries including DMS (Demonstration Multipurpose School) were automated. In order to complete the project, the PAC approved program “N.R.C.E.” is the key pilot project. Once automation work was over, the “Barcoding” was taken care of. Once bar-coding got completed, all the constituent libraries were instructed to provide a link through institutional websites. The DLDI website was launched in February, 2012. In course of time, the WEB-OPAC took a place in the DLDI website. The DLDI website was the first website amongst other Departments to be developed in-house, which was lauded by the J.D & JD (CIET). More and

more appreciation by the authority and visit of international readers led the DLDI administration to develop union catalogue and interlink the constituent libraries. The Director, NCERT showered appreciation for the library services showcased during Foundation Day of the council by the staff and showed his interest to upgrade the Libsys version 4.0 to 7.0. But due to some reasons, it could not be implemented and there was a top to bottom directive to migrate to KOHA. Directives from the top management have to be kept and implemented without any second thought. Let us move ahead in search of parameters for use of O.S.S. and understand the legacy data created due to transformation took place in the DLDI..

3.0 Transformation in DLDI

Libraries and Information centres existed, are existing and will exist for future to come. Libraries are always pioneering to integrate the information technology in the existing housekeeping operations and services. Change is inevitable; keeping in mind the change in technology, economy, users’ need. But frequent change in policies and practices lead to havoc. Therefore, libraries follow standards and mostly the workflow of different sections is similar to other libraries irrespective of their type. The following are few examples of transformation that took place in DDI.

- Library brochure **to** library website
- Library catalogue **to** OPAC
- OPAC **to** WEB-OPAC
- Print journals **to** online journals
- Print resources **to** database
- Text Books **to** digital textbooks
- Grey literature **to** institutional repository
- NIE members **to** Delhi & NCR Community
- Traditional reference service **to** E- reference service
- Duty chart **to** R.F.D. (Result Framework Document)
- Conventional resource sharing **to** Document Delivery service (DELNET)
- Onsite information products **to** online information products
- Information through letter **to** information through SMS
- Internet access **to** Wi-Fi access.

In order to bring the aforesaid changes the librarian takes the lead role but involves the whole team. The management techniques are common to all the

libraries for total quality management, which are as follows:

1. Financial management (Cost benefit analysis)
2. Budgeting (Zero-based budgeting)
3. Change management (Automation of libraries)
4. Human relations (understanding the need of the readers)
5. Human resource management (Staff management)
6. Job analysis, evaluation, descriptions through duty chart
7. Management by objectives (Formulation & achieving goals)
8. Management and information system (Decision- making)
9. Marketing (Understand the community and customize their services)
10. Motion and time study (To improve procedure in library activities and services)
11. Network analysis (Maintaining time schedule)
12. Operations research (Designing information services and analysing user behavior for document delivery)
13. PERT/CPM (To provide CAS,SDI services in minimum possible time)
14. Project management (To handle PAC programs within limited resources)
15. SWOT analysis (For effective functioning of libraries)
16. System analysis (Analysis of different sections for reforms)
17. T.Q.M (For customer satisfaction)
18. Participative management (Regular meeting with staff)
19. Research- cum-Development related activity (Textbook archive, Development of manual, Development of C&D policy, Development of book entitled “Role of school libraries in quality education”, Development of Institutional Repository)
20. Training (Organise training programs for school/DIET/SCERT Librarians)
21. Extension program (Organise information Literacy programs, national seminar, symposium, workshop)
22. Lecture program (Deliver lectures on library related issues in short-term long-term programs of the academic depts.)
23. Radio Talk (Deliver lecturer for librarian community)

24. Research guidance (Become guide/supervisor for M.Phil., M.LIS, BLIS, PGDLAN courses)
25. Collaboration with constituent libraries (Organise programs & helped the RIEs in accessing NLIST of Inflibnet.)

Having understood the changes taken place and showcased during the foundation day under the theme “Reform, Perform, Transform, Inform”, the Chairman Library Committee expressed his gladness and enlightened about the initiatives of Meity to promote Open Source Softwares. Let us add this idea to the think tank of LDD. A lot of ideas poured and migrating to the OSS got approved by the authority. Now, it is time to understand the legacy data, which needs to be migrated and few new features can be added to it.

4.0 Quality of legacy data

When the legacy data is under editing stage, lot of care has to be taken from professional point of view. The legacy data belong to different modules-namely: acquisition, cataloguing, circulation, journals, maintenance and administration. After five years of use of the software, in 2006, the professional staffs were in darkness about how to enter the data so that proper output is available to the readers’ community. How to develop the borrower’s card so that the card can be issued without any delay? How the orders can be generated for the vendors? How acquisition section & cataloging section can be interlinked to save the time of the reader. How can the bar-codes be generated to facilitate issue/return and generating the gate-pass.? How the resources under different collections can be assigned the collection number? How can it be possible to differentiate between general books to reference books? How the readers can be identified between academic/non-academic, external/institutional member, and special/ casual member to students. This needs brain-storming. When we go for over-due collection or exchange rate for foreign currencies decision is needed. Besides, during procurement of library resources, the library discount is also very important for mapping in the software. The journal titles have some uniqueness along-with the publishing firms. The characteristics are usually taught to the library professionals and they carry-out the job perfectly. When the journal titles are complete, they are sent for binding and then accessioned with accession series. It is very important in the part of the library staff to assign the series. Accession register is the master document and every

item gets the unique accession number. This facilitates to locate and know the status of the document- issued or lost or weeded out or written off or sent for binding or available on the shelf. Finally the accession number is helpful for stock verification according to latest GFR. Once the data entry for all the modules is over, It is OPAC for the use of the readers in LAN and WAN. On the basis of the available database and Internet of Things data, the CAS and SDI services are taken care of and dissemination is facilitated. Accordingly, the library services are developed in the form of information products. The information products include: New arrivals, Current contents, Book Reviews, Press-clippings under the heading Edu-Doc services. The software has the scope for article indexing service. Subject bibliographies were developed on demand. Such bibliographies include: Bibliography on Inclusive Education, Textbook Archive, and Bibliography on Light, Bibliography on Gender Inclusion, and Bibliography on Learning Outcome. Bibliography was also developed in the eve of international year of Mathematics.

The textbook archive is one of the important collections, attracting the IAS aspirants. This also got a place in the library database. It is worth to mention that, the data entry of house-keeping operations for all the modules and editing was taken care of by the internal staff of LDD giving rise to a quality database disseminated through DELNET database and LDD website, linked to NCERT website (w.e.f. Feb, 2012) and available to the wider-world in the form of WEB-OPAC. The visibility of the quality database attracted a good number of readers world-wide to use the library physically or through virtual mode, i.e. hitting the website. The usage can be assessed through the number of visitors in the website.

The database can be treated as quality database, as all the professional staff of LDD understood the work as their business and followed standards as instructed by the senior professionals followed by editing by the young, skilled and knowledgeable professional staff following “Rule of thumb” of LLD administration. The real project has lakhs of legacy data stored in the hard-disk. The data was being stored in the hard-disk for which the faculty of LDD was engaged. In addition, the faculty was taking care of the server to remain open 24/7. The data source owner i.e. HoD, LDD is the original owner of the data. The data store owner is the one, who is responsible for the data storage. The library professionals are responsible for the house-keeping operations in different sections of

the library. Usually in bigger libraries, data source owner and data store owner are different, whereas in small libraries, both the responsibilities are taken care of by one person. In the absence of software up-gradation, the data-set become out-dated or obsolete. But the data is known as legacy data. Such data has legal implications. The legacy database holds copyright and is handed over from one HoD to the other HoD. When we get a directive for migration, we see the real project had scores of legacy data stores and the new system is having hundreds of tables. In real world it is not that simple! We have to keep in mind that, a bad start up data is a curse of many projects. Now we can understand the situation in the library, when we start migrating, from a practitioner’s point of view

5.0 Practitioner’s perspective

You have drawn the short straws. You have shown your interest and have proposed the program, which got approved. You have been given the responsibility for migrating data into the exciting new system. But you neither have any knowledge about the development of the software nor your professional staff. You are crazy because you will gain marks for this. You have never done such kind of work before. You woke up middle of the night and you know that the data is not clean as you have not contributed for the editing of the database a decade before. It was carried out by the contractual staff under the supervision of the top manager. As you have neither worked nor have done any brain-storming, you are very cool. You have friends in the constituents as well as in the profession. You convince the top manager to invite experts for consultancy and try to migrate the data without understanding the parameters. You rely on them. The readers started pointing out the errors due to data migration. Error types being data loss, mismatch and so on. You try to provide the Web-OPAC to the outer world, but in vain. It seemed like one long hopeless panic, but you don’t bother as authorities trust you. You can easily bias them and you get the appreciation. One of the middle managers is worried about so and started doing the feasibility study. You join hands with the HoD. He validates the data with the help of the staff under your guidance. As he has trust on you, you carry out the program and get your required points. As the middle manager completes the feasibility study, the HoD, declares the crash of the server and loss of data. The middle manager handles meticulously and convinces the top manager to upgrade the existing software to cloud. But you feel

underestimated and are afraid of your reputation. You won in convincing the boss and try to continue migrating. All of a sudden you come to know that, legacy data got crashed. Then all are perplexed. The top management with your help instead of situational analysis finds out professionals from other institutions and migrate the data. The HoD leaves on the senior- most professional, who fire-fight for data errors. The middle manager asks not to worry and go for feasibility study. How to recover data? How to recover data? The shelving is disturbed due to lack of staff and renovation. You advise your HoD- loading data is easy. No worries. You express your idea for data migration. You ask the HoD to go to one networking institution, who shares your data. All of a sudden one of the professionals, who happen to be the near and dear to the HoD declares- Oh no! Wrong news! Server is working and data is not crashed. Another shouts- oh! Data is in the computer system .No worries .A little knowledge is a dangerous thing. Someone – a novice- declares that, she has friend on high ranks and it is possible to recover the data. The middle manager is engaged in feasibility study & points out different issues. Let’s visit websites of HEIs and browse their OPAC. He finds that, under one accession number, 33 results! Alas! He felt it is a serious fault of the software as accession number is always unique. Browsed for series. Oh no! The same result. Visited other libraries and browsed. Nothing new. The serious middle manager says – very often migration begins with technology and ends with disaster. When the HoD imitates the migration procedure from other libraries, situation becomes horrible. The database is crashed.

New Systems were procured. New young, energetic, skilled staffs were engaged. One of them declared his skill in installation, which proved to be theoretical. Other declared that, KOHA is possible. When asked in depth, replies- I have seen in many places. So, it is possible. The third one is confused. According to him some technological institutes are successful. The fourth comments that- Libraries are shifted to KOHA, but again back to proprietary software. Different people different opinion. The HoD is confused and finally sticks to his decision and asks to start recovering the data. The excel sheet consists of basic bibliographical data. The IT department is confused but stick to their decision for data recovery. Hundreds of excel sheets are ready. Immediately, the account section is asked for identifying the outsourcing agency through GEM (Government E-Marketplace). The Agency will capture the data structure and bring transformation. The accounts section is of the opinion

that, as O.S.S. are not standard products, GEM is not possible. Demo is arranged.

The agency shows his confidence. Of course, there’s slight worry about the previous legacy system, whose data never fitted into the new system due to non-standard vocabulary. There’s no source code for legacy data, as it’s a proprietary one. One of the colleague mentions special use of the fields in excel sheet and confident that it can be sorted out. Time is running short and things are going to be a bit tight. Coding starts, Bugs should weed-out. Then only task of securing a part of real data from the legacy data is possible. All of a sudden, the perplexed programmer runs at your desk and informs that, 10,000 out of the target record of 20,000 failed. The programmer could not understand. The code worked with the test data. May be it’s the data problem. Other programmer uncovered a data gap. A vital link is needed by the new system, which doesn’t appear in the old. There is linking table. It is purely a technical issue. All of a sudden other 05 data errors are traced in the legacy system. This makes it impossible to locate the correct record type. The programmer is of the view- they don’t know the meaning of data items, they know the rules by which they should be linked. It is an end user data problem. The user is made happy. Now an old bug reappears. The maintenance section in-charge laments- How to do stock verification? End of the project descend into a spiral of mutual recriminations, disappointment. The HoD orders- enter the data afresh. Let it take its own time.

The middle manager thinks, ohh! We are back to 25 years, let us burn our ego and renew the proprietary software. Money is not a problem. The HoD decides- let us renew, repair, replace, re-host, re-architect and retain for sustainability. No need to retire. No need to quest. Let us travel by a train. As migration to O.S.S. is top to bottom directive, we have to follow that. Therefore, running both the softwares in a parallel manner, we can achieve the goal.

Let us understand, what is data migration, what are the parameters to choose OSS for LICs. We have to ensure the feasibility too.

6.0 Data Migration

Due to top bottom directive, the library is in the process of migrating from Libsys to Koha. We have the data backup in the hard-disk. Storage migration is the need of the hour. We have to transfer the data from storage server to destination server. In case of crash of the server, it becomes difficult and time

consuming. In IT terms, for the same objective, we have to use orchestrator server, which was applied by Niti Ayog library. Orchestrator is a workflow management solution for the data centre. With orchestrator we can automate the creation, monitoring and deployment of resources in our environment. Orchestration helps IT to more easily manage complex tasks and workflows. By doing manually, it is not a scalable strategy. The source and destination computers must have the firewall rules. If the computers belong to ADSD (Active Directory Service Domain) they should all belong to the same community. The destination server must be in the same domain as the source server.

ETL Tools are very well-suited for the task of data migration from one database to the other. Such tools help in data extraction, transform and load which are the domain of the IT team. It is a data integration process that combines data from multiple data sources into a single consistent data store, that is loaded into a data warehouse or target system. ETL completes the work of extraction, clean, transformation, loading and analysis. ETL languages are: Bash, Python and Perl. As KOHA-the OSS-uses Perl, ETL is compatible to it.

Application migration: Application migration is the process of moving software applications from one computing environment to another. One data centre to the other, public to private cloud or from institutional server to cloud providers’ environment. It is observed that, in case of proprietary software, the data is stored in recorded-based format, causing difficulty in migration to store data. Migration is mapping of data between two structures. Universal format is prepared, that incorporates MARC 21 format.

6.0 Parameters for use of O.S.S

7.1 Feasibility study takes the front seat while changing from one software to the other software. The standard vocabulary, rules for cataloguing of print, non-print and electronic resources are very important. The scope of cataloguing in the proprietary software and the open source software need to be compared. The change over should lead from good to better and database should be built to last.

7.2 G.F.R (General Financial Rules) has a ruling for outsourcing in the presence of the qualified and skilled staff for any activity. We have to get work

done either in-house or through out-sourcing keeping in mind the latest GFR.

7.3 We have proprietary software, which needs to be retired from the system. Once we retire we cannot have our legacy data from where we can migrate to the new system. It is necessary to run both in a parallelmanner. The open source software needs coding, while bringing reforms in the absence of the programmer. How the security audit is possible? It is essential to board a technical staff like programmer, having command over coding in the work force.

7.4 We all know that, we have to understand the Linus law for open source security. The code needs to be reviewed or audited by the cyber-security professionals.

7.5 Every single line of code cannot be reviewed objectively giving rise to error in the software. The OSS is full of bugs, which need attention. Linus Law asserts that given enough eye-balls, all bugs are swallowed. But we exactly don’t know how many eyeballs are enough.

7.6 We have to stress on the use of back end and front end Operating System softwares compatible to the application software and use of their commands through training programs.

7.7 The library administration can stress upon consultancy and training to staff in order to meet the scheduled time table keeping in mind GFR on force.

8.0 Feasibility study:

a) Scalability: is the property of a system to handle a growing amount of work. Scalability of the software has to be ensured.

b) Bugs: lack of co-ordination of the work-flow delays in addressing bugs.

c) CGI (Common Gateway Interface): In computing, CGI is an interface specification that enables webservers to execute external program to process HTTP user requests. Such programs are often written in a scripting language i.e. CGI script. Perl, the CGI script may lead to data hacking.

d) Database management: MYSQL, an open source relational database management system based on SQL. MY SQL needs GnuPG signature. Such signatures are widely used by LINUX package managers, i.e. apt to verify the integrity of down-

loaded files. Typically the public key is shipped with the O.S and private key is owned by the repository maintainers. GNU private guard (GPG) uses public key encryption. This is the great way to send somebody highly confidential data. Without proper knowledge of MYSQL, adding templates for report is not possible.

e) Z39.50: It is a computer to computer communication protocol designed to support searching and retrieval of information in a distributed network environment. It tries to meet the changing needs of information creator, providers and users. It is a client- server protocol for searching and retrieving information from remote computer database. In short, it’s a tool used for copy cataloguing. It’s a protocol thatallows you to search and import library records from remote database such as OCLC.

f) Concept of system administrator: System administrators support, troubleshoot and maintain the computer servers and networks. They design and install computer system, routers, switches, LAN, WAN and intranet system. They can be network administrators, database administrators, server administrators, security system administrators.

g) User friendly interface:It is a software interface, where the user can easily understand and navigate through the application in an efficient way. Here, options are offered to the user via menus.

h) Generatingreport: Report generation is a mechanical process of extracting the data from the database and then organising and exporting into reports. It should be through word, excel, pdf and HTML format.

i) Workflow: Workflow in different modules has a role in the programming, which reflectsthe flow-chart of the library housekeeping operations

j) Accession series: In libraries, the accession numbers are assigned in the form of alphabet. For example: For gifted books the library assigns “G”or “F” to distinguish the accession number. Similarly, when journal issues are bound and accessioned, the number is assigned prefixing or suffixing “J” depending upon the authority file of the institution. Same rule is followed for non-book material like CDs, Maps, and cartographic materials and so on.

k) Data loss: While migrating, it has to ensure that no data loss happens

L) Software stability: Usually open source soft wares have different versions throughout the year. Same happens with KOHA.The user department has to ensure that, the version used is the stableversion.

m) Possibility of auto-updation: Usually the libraries follow a particular version and the software is released in updated versions. It should be the responsibility of the customer to verify if the data gets updated on its own.

n) Use of connecting symbol: The technical section of the libraries deal with classification and cataloguing of library resources. The class numbers and content of the catalogue cards including ISBN have a lot of connecting symbols. Therefore, our legacy data with connecting symbols need to be migrated.

o)Maintenance cost: In proprietary soft wares, we pay AMC. But paying AMC for OSS has to be verified from GFR on force.

p)Support: Lack of technical support and level of customization affects uniformity, which is a major concern.

9.0 Quality of data Migration

Data migration can be the difference between benefit realization and lost opportunities. It should be focused on the following:

- a) Realizing all the benefits,
- b) Creating the improved enterprise performance,
- c) Importing the best data,
- d) Maintaining all the regulatory- legal and governance compliance criteria,
- e) Staying securely under the control of the project for sustainability.

10.0Data migration methodology

The steps for data migration are as follows:

- a) The development of tables of KOHA software adopting MARC21 tags,
- b) Collection of data from LIBSYS software,
- c) Inserting the data in excel sheet ,
- d) Matching the data field and subfield,
- e) Transferring the data to MARC editor,
- f) Converting excel to.mrk format,

- g) Converting .mrk to .mrc format,
- h) Upload .mrc file,
- i) Exporting .mrc data to KOHA software,
- j) Rebuild zebra search engine for indexing structured database,
- k) Data validation.

11.0Roadmap

- i) The project coordinator has to be empowered with the driver’s seat along with power and support for carrying out the responsibility.
- ii) Series of meetings are to be conducted with the professional and administrative staff to find out the areas of strengths of the staff to discuss the project in detail so that there is no communication gap.
- iii) Assigning the duties to different staff to achieve the goal in phases.
- iv) Retaining the legacy data.
- v) Feasibility study of the new software and its compatibility to the existing situation and bringing changes in programming if needed.
- vi) Hardware requirements for the new system compatible to the software.
- vii) Organisingworkshops to discuss different technical issues for migration
- viii) Installation of the OSS(Stable version-Latest)
- ix) Customisation of the software in compatible to the existing software (programs to continue with the existing workflow) in clients.
- x) Get the security audit certificate from the IT team.
- xi) Organise training program to facilitate the work-force.
- xii) Mid-term review of the work progress of different modules.
- xiii) Module-wise migration in phases.
- xiv) Analyse the migration position through data validation according to standards in the said field.
- xv) Celebrate the short-term success.
- xvi) Keep the OPAC open for the end-users, so that the feed- back can be obtained for improvement.
- xvii) Once full migration is complete, analyse the data loss if any and keep continuing the job.
- xviii) Once full satisfaction of readers is felt, we may get rid of the older software by providing the retirement certificate to avoid legal issues.

- xix) Keep on updating the front- end, back-end soft wares along with the business software to walk along with the development of IT.
- xx) RFID integration if needed

The aforesaid roadmap envisages the operational feasibility and helps in achieving the goal working differently keeping in mind the following challenges:

- a) Problems while issue/return through RFID
 - b) Find out if added entries are imported
 - c) More than 80 letters are imported or not
 - d) Details of accompanied materials are visible or not
 - e) Stock verification is possible or not
- If any problem is visible, we may try to resolve with the help of the KOHA community

12.0 Conclusion

For each and every library, irrespective of their size, type, resources and services the epilogue is “local variation”. The top management along with the library administration keeps in mind to think globally and act locally. As we establish, launch and serve, we follow the five laws of library science as the epicenter of the library activities and services. The trinity of library services is behind the five laws of Library Science for smooth implementation. The house-keeping operations are based on the subjects taught during the professional course in the universities .While working, the theory is converted to practice on the basis of the authority file of the institution. The newly established institutions have to develop their institution-specific authority file. While serving it is seen that professional activities are carried out with the help of the specific workflow designed. In course of time, this is converted to flow-chart. Once the business is over and takes a flying wheel, there is a need to integrate with IT.As a result, the housekeeping operations are automated and digitized for visibility. The working professionals experience the general principles of management in libraries, which include: Division of work, authority and responsibility, Discipline, Unity of command, Unity of direction, Subordination of individual interest to general interest, Equity, Staff retention, Initiatives and finally Esprit De Corps.Library works are interdependent in nature. While automating the library activities, the software selection is done with full care and with expert opinion and keeping in mind the institutional need and budget position. Because, migration of database afterwards is a tough job and may lead to failure. Niti Aayog experience shows that, mapping of data between two structures is

required i.e., from old to new. The steps followed by Niti Aayog were from Libsys to CDS/ISIS, CDS/ISIS to Excel, Excel to MARC 21, finally importing the data to KOHA.While manipulating, some data is lost. If at any case, library server is crashed, in order to repair the legacy data, one has to renew the proprietary software. Finally, the author concludes to choose the library software keeping in mind the type of library, collection size, budget, size of skilled staff, Infrastructure available. If the institution has a glorious past, you have to understand the past to envision the future. The author concludes saying, “Keep past in head and future in hand” and without doing different things, do differently to achieve the audacious goal.

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