Migration from Proprietary to FOSS: A Journey or Quest

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Abstract

Among the various categories of soft-wares, two main categories include application software and system software. Application software fulfils a particular need, which can be categorized into proprietary and open source. In the automated environment of library and information centres, sometimes the technology compels for migration. In this article, the author initially describes how the digital India initiatives benefit society in many ways. According to her, one should know about the roots of automation before migration so that the past is in our brain and the present in our hand. When we know about the past, we are very much aware of the legacy data, the quality and the short-comings. Then we assess the change, know the purpose of change, change plan, implement the change and try to sustain the change. Once we plan for change to FOSS, it is the lawof natural that some employees resist the change for many reasons. We have to overcome the resistance strategically. Latest GFR should be consulted, as we are dealing with matters involving public finance. Once the feasibility study is complete, based on the work-flow, the library professionals plan to implement the migration process.

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Keywords

FOSS; Legacy data; change management; Kotter's model; KOHA

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1. Introduction

When we talk about migration, at the outset we take it as human migration. In this perspective, usually we talk about internal migration, external migration, immigration, emigration & return migration. Why do people move? They move for economic, social, political, demographic, environmental and physical reasons(natural hazards). It may be inter-urban or intra-urban. Similarly, technocrats have divided the migration approach into five types 1) Retire 2) Replace 3) Re-host 4) Re-architect 5) Retain. Due to the advancement of IT, we have cloud technology and all are trying to use it. Migration typically happens in three stages: assessment, migration, and optimization. During the assessment phase, time is taken to determine the feasibility on- what can be migrated its current configuration. A migration plan is developed and a roadmap is laid. During brain-storming, various types of questions come to the mind of the team players. Especially cost-benefit analysis, risk factors, additional benefit factors, etc.

Due to the digital initiative, the flagship program of the Government of India, was launched on 1st July, 2015 by P.M. of India. There are three components of this initiative.

1) Digital Infrastructure.
2) Digital Delivery of Services.
3) Digital Literacy.

The mission of the flagship program mentioned above is "Power to empower". Digital India program focuses on restructuring many existing schemes that can be implemented in a synchronized manner. The citizens of India felt the advantages through increase in electronic transactions. 1.15 lakh Gram-Panchayats were connected through internet. Common Service Centres (CSCs) were created through integration of ICT. Urban internet penetration has increased. For any new initiative, advantages and disadvantages are both sides of a coin. The internet speed is experienced to be low, digital crime has increased. Digi-lockers, Bhim, e-pathshala, and e-hospitals are available in digital platforms. Through nine pillars of digital India, all are being benefited.

We all know that, Library movement came to India from the Western countries and same with the innovations. There are open source office soft-wares, open source accounting soft-wares, open source operating soft-wares, open source website soft-wares, open source browsers, open source IT security soft-wares etc. Similarly, KOHA is a FOSS for library

automation asoft-ware, whereas D-space is meant to develop digital library software developed by MIT.
ICT integration in the library field is not the librarian's decision. The librarian desires and the authority with expert opinion decides the software to be used. Libraries are known as democratic institutions.For the benefit of all types of citizens keeping in mind the five laws of Library Science, different innovative practices are used for optimum use of the library resources. Now-a-days, institutions are utilizing their own special techniques to satisfy the readers, who are drowned with knowledge and starving for information. Reading habit is marked in descending order in all class of readers. But the library professionals are bringing transformation in the library automation and digitization field. GOI took the initiative for digital India, but librarians took initiative in migrating from the legacy system to FOSS.

2. Route to the roots of automation

Library Professionals initiated the application of computers due to information explosions. The computer era can be divided into: Pre- computer era (1950s); stand-alone era (1960s); online system (1970s); microcomputer era (1980s); web era (1990s) and open era (2000s). This led to emergence of open library systems powered by open source software, open standards and on-the-fly integration with open data and open contents.

Keeping in mind the integration of IT, the institutions moved forward towards the journey of library automation. Usually such types of decisions are done through a committee as discussed earlier. The committee makes final decisions based on human-ware, hard-ware, and soft-ware and the available budget for maintenance. Decision of the committee on software is very important. Some libraries choose CDS/ ISIS, some "SOUL" of INFLIBNET, some "LIBSYS"(different versions or modules) some "LIBMAN", some "E- Granthalaya" and so on. The journey of library automation starts in full swing, keeping in mind that, "Bad start up data is a curse of many good projects". The professionals take sufficient care to enter data in the proprietary software chosen by the institution. It is as good as a train journey. You book the ticket, occupy the seat and imagine the train journey metaphor is the best journey. Finally we arrive at the destination. Arriving at the destination becomes a successful project &in the field of libraries the readers benefit from this and the ownership is realized without any problem. The data entry journey goes astrain when we use proprietary software. At the time of selection of the software, the top managers are usually involved; who takes note of the work flow of different sections of the library based on "Rule of thumb", the infrastructure requirement, time bound retro conversion of books, journals, circulation data and data meant for maintenance purpose. Usually the staff is trained for the purpose and the work is done in-house. At certain cases, the data- entry operators are engaged to complete the job within scheduled time-frame. The institutes having branches are taken care of by the initiative of the HQ Staff. While choosing the software, the committee values detailed study of the software, hardware requirement, human- ware and the needs of the constituent units. Once the software is chosen, required hardware procurement begins and staff training is arranged. The journey goes on once the employees are trained on different modules and know the standards followed for data entry. When all the libraries reach the destination, the link to the website is given so thatthe data-base gets visible to the outer world. Through WEB-OPAC the database also is merged in the union catalogue for inter library loan purpose. The back- up is taken for any kind of disaster. Once the database is ready, it is only maintained by the professional staff. The top library management explores different types of holistic programs for the benefit of the stake- holders. Under research cum development, training and extension programs, library gets collaborative research programs/ projects and enhances its reputation by interlinking the libraries of the same type. For example: The library at Headquarter of NCERT can interlink with the constituent libraries including DMS libraries. Once this linkage is over, they can connect with all the SCERT/SIE libraries. Once all the states/ UTs are in the pipeline the DIET libraries can be automated and linked. This principle can be applied to other libraries too. If libraries have no branches/ constituents, interlinking with libraries of the similar subject is possible. Exploring the resources under primary, secondary and tertiary sources and digital resources can be of great help in analyzing the resources and converting into capsulated resources for class-appropriate and age-appropriate readers. Once the automation process makes its journey smoothly, the Institutional Repository comes in the pipeline, which becomes a continuous process using D- space/ E- print software. This leads the library staff to become well- versed with free and open source software. Once automation & digitization is in their journey, the programs for the community on different national/ international days

and different govt. related schemes can be organized. The librarian as the master thinker brings the library services to the limelight, the reputation enhances. However cyclic data cleaning, and editing takes the front seat to maintain the data quality issues. The administrative responsibility lies on updating the software and hardware.

3. Legacy Data

The libraries have the legacy data, once they complete the retro conversion process. Preserving legacy data is a continuous process, as procurement, technical processing, circulation, processing of journals, Issue/ return, membership maintenance job is a never- ending process. The database developed due to efforts of the library staff is preserved, otherwise known as the legacy data. The data source owner, the data store owner, the stakeholders for the database are very important, who are key players from the domain subject. The data source owner is the one who is the original owner of the data. The data store owner is the one, who is responsible for the data storage. In bigger libraries both are different. Professionals are responsible for housekeeping operations in different sections of the library. Data quality matters a lot. Therefore, data editing is part of a regular work process. By data editing, data is cleaned giving rise to quality data. In institutions, the software, hardware and server configuration is upgraded from time to time for safety of the database/ dataset.

The data source owner, data store owner is mostly the same person, who acts as the system administrator. In the absence of software up-gradation, the dataset becomes outdated. But the data is known as legacy data. Such data has legal implications. Therefore, such data is transferred to the new in- charges or new HoDs. The legacy database holds copyright. As the database is not verified in many cases, there's every chance of data quality challenges. Usually proprietary soft-wares are not changed until and unless there's a directive for migration. In case of migration, legacy data has a vital role to play.

4. FOSS

Ministry of Electronics and Information Technology, coinciding with the digital India initiative, made efforts to promote and foster the adoption of Free & Open Source Software (FOSS). FOSS has advantages like increasing inter-operability, developing local capacity, reducing cost, achieving vendor independence, enabling localization reducing piracy. Accordingly, the FOSS products are: BOSS (Bharat Operating System Solutions), EDUBOSS Educational Variant of Boss, BOSS Server, Meghdoot, Swarsuchak, GEM (Government E-Marketing), Anuman, ALVIC (Accessible Linux for Visually Challenged), creative computing @ schools, ILMS(Integrated Library Management Software)-KOHA.

5. Change Management in Library Software:

The journey of library automation is most smoothly. Suddenly, there's a proposal for change in library software, without undergoing the following change management process as part of the feasibility study.

- Assess need for change,
- Purpose for change,
- Plan for change,
- Implement the change,
- Sustaining the change.

As change is a costly affair, it needs to be taken care of carefully and thoughtfully if the change is needed. Usually change happens due to a directive strategy from top management. When expert strategy is taken, they take change as a problem-solving process. So, a negotiation strategy is needed. Accordingly, the participation of staff is needed for retro-conversion instead of outsourcing. Use of in-house software leads to enhancing staff skill.

Unplanned change encourages all to buy into the process, which brings about renewable or recommitted on the part of the organization and the people working on it. Change is sometimes, forced upon an organization from outside causing it to react. Successful change efforts come from within which leads to set the change, implementing the process and the evaluating the impact. Deep change efforts distorts the existing pattern of action and involves this risk-taking .Deep change leads to questions like who, what, when, where, how and why?

5.1 Resistance to Change

Change is inevitable. Change may take place to bring reforms in the work-flow. Change may occur due to incorporating standards developed/ adopted by BIS. In the beginning of any change, resentment is there for change if there is no transparency. Employee resistance is the part of human behavior. The organization needs to understand the causes of resistance. One may be lack of trust in the leadership,

poor communication, fear of failure or threatening to lose their job or transfer the staff. If the authorities frequently change the leadership, the employees are less likely to accept change. Involving stake-holders, listening to employees, educating the employees on the value of change (Why change), change with strategic planning and providing on-going support helps in positive feeling towards change management. Change can effectively be managed with planning and anticipation, even if change is hard for both employees and employer. There's resistance from the employee for the following reasons:

1. People don't understand,
2. Not fully informed,
3. Habits and securities are threatened,
4. Speed causes strain,
5. Change is difficult to implement,
6. Sustaining the organization's viabilities,
7. We can view the big picture and begin to address "Why to changes?"

The resistance to change emerges due to either a threat to something that the individual values or just a perception. Lack of understanding or fear of failure or lack of competency or feeling overloaded or some professional put genuine objection.

5.2 Participatory strategy

Participatory strategy is nothing but the involvement of all professionals in the change process. Though the decisions are taken at the top management, taking the views of all the professionals is very important. Instead of understanding the genuine professional objection, people discuss different causes of resistance, either psychological or doubt on employee's skill, knowledge and expertise. Resistance is lowered when the employee is involved in the change process with transparency. Sometimes the employees resist because of fear or anxiety. Sometimes they feel that the new system won't work as the old system through discussion. But remain silent due to biasness. Sometimes, it is forced upon the employee through threatening that, resisting change may lead to not promoting but the authority never recommends for feasibility study. Therefore, change becomes failure, which remain silent behind the screen. Change process sometimes lead to complexity without vision and getting short- term wins, declaring victory too soon.

6.Kotter's Model to Avoid Mistake

John Kotter has suggested an eight-phase model to avoid mistakes.

1.Establish a sense of urgency,
2.Create a coalition,
3.Develop a clear vision,
4.Share the vision,
5.Empower people to clear obstacles,
6.Secure short- term wins,
7.Consolidate and keep moving,
8.Anchor the Change.

Change management is application to all sectors including libraries and information centers. Libraries are pioneering to integrate information technology. Change is inevitable considering the change in technology, economy & users' need. But frequent change in policy and practice lead to havoc. Therefore, libraries follow standards and "Rule of thumb" as mostly libraries have same workflow.

7. Approaches of Change Management

There are four approaches to change management.

- Leader-driven approach
- Process-driven approach
- Team-driven approach
- Change management approach

- The leader-driven approach is more suitable for small and medium enterprises, where the leader has required information and knowledge. This is directive and non-participatory.
- Process- driven changes are led by experts or outside consultant and supported by the leader. These changes are more common in large and bureaucratic organizations. This approach works well when the change requires technical or specialized expertise. But it's unsuitable when the workforce is young and highly skilled. The environment is complex and dynamic. It requires active involvement of the internal staff.
- When properly executed, team-driven approaches are more common and based on TQM (Total Quality Management), QC (Quality Control), and Six Sigma lead to innovation and productivity.
- Change management approach is a combination of expert-driven and team-driven approaches.

8. General Principles of management in libraries

1. Division of work: The work is divided according to post & specialization.

2. Authority and responsibility: Both authority and responsibility goes together.
3. Discipline: This enunciates Dos and Don'ts in the library.
4. Unity of command: "One Boss" in the motto of the principle.
5. Unity of direction: "One plan- one direction" in achieving the goal.
6. Sub- ordination of individual interest to general interest.
7. Scalar chain- Unbroken line of authority from top to bottom level.
8. Equity: Treat everyone equally.
9. Staff retention.
10. Initiatives should be encouraged.
11. Esprit De corps- the importance of team work.

9. Practitioner's perspective

1. Out of four approaches for change, process-driven change is very authentic as the leaders support the outside experts.
2. Role of G.F.R. (General Financial Rule): GFRs are a compilation of rules and orders of the Government of India to be followed by all, while dealing with matters involving public finances. These are treated as executive instructions. The Expenditure Management Commission is set up in 2014 to recommend ways to increase public expenditure efficiency.GFRs 2017 have evolved asa result of wide consultations with the Central Government,., ministries and Departments. Any rule aims to provide the framework within which the organization manages its business in a financially prudent manner without compromising its flexibility to deal with varied situations.

3. When there is a directive for change in the library software without following the approaches of change management, the role of professionals is very important. The leader and the workforce need to make a feasibility study. They need to find out the characteristics of the software from different angles. The theory taught in the class, the work-flow of the organization, the local variation applied, the scheme of classification followed, the cataloguing rules applied to varieties of collection, the corresponding tool used to derive key-words, Indian standards developed/ adopted and used. Then the compatibility study.

4. **ILMS-KOHA:**

1. Developer : Developed by a student, research scholar.
2. Country of origin : New Zealand
3. Language : Based on 22 Languages of the West.
4. User friendly : Not user friendly. Need R&D for every task.
5. Computer language used: CGI script written in Perl language.
6. Stable version : Not clear as 2-3 times updation in a year.
7. Support : No support. Need to contact KOHA community.
8. Security: CGI program may compromise server security.
9. Vulnerability : Vulnerable
10. Multitasking : The server language Linux, And MARC 21 format contains 10 paged tags.
11. In-built help for Cataloguing : No
12. Standard Terminology :Not available
13. Cataloguing: In proprietary software justified fields are there. In KOHA one has to cover all 10 paged tags.
14. Standard database : As open source languages are used, no standard Data-base. It does not follow ISO standards.
15. Hide and Hold : Creates problem in the database.
16. Acquisition/serial : Not effective approval process
17. Collection : Involves complexity during up-gradation leading to Data loss.
18. Accession series : No scope.
19. Search through accession : Multiple results. Number
20. Binding Management : Not available
21. Standing order : Not available.
22. E-mail service : Need integration.
23. Unicode : Not available
24. Uniform subject heading : No SLSH for DDC users
25. Security audit : Bugs are many
26. Indian Class number(CC): No support
27. Stock. Verification : Not supportive
28. Change of version : Up gradation problem.
29. Accession No. :Term does not exist.

30. Issue/return through RFID: Problematic as mismatch.
31. Interlinking : Difficult as different libraries use different versions.
32. Sustainability : Doubtful.
33. Union Catalogue :Not possible due to use of different versions.
34. Budget spent : Not cost-effective.
35. Data Loss of Journal : Vol. & Issues is not transformed.
36. Information ISBN : Not following standard format
37. Boolean search : No.
38. Concept of System Administrator : No.
39. Report generation : Not easy.
40. Data Loss : Yes.
41. Auto updation to new Version : No.
42. Fine/ overdue charge Management : No.

9.Conclusion

The feasibility study is a procedure to predict the outcome of an investigation, examination or assessment of a planned scheme along with the possible gain. This aims at evaluating any project. The feasibility study is very important to determine if the project is feasible for the institution. While studying, the expenditure towards the project from cost-effective point of view needs to be analyzed. Here the project adviser needs to follow the directives provided in GFR (Latest version) in Indian scenario. Once economic feasibility is under control we have to find out the status of the legacy data. Quality data is very important. As 'KOHA' is an integrated library management system software. The software being originated in New Zealand and ours libraries are from the land of the father of library science in India. We need to take five law of library science as the base. The library professionals, irrespective of their positions and qualifications gained; need to know the work flow of different sections. The work flow is the basic schema to customize the FOSS. Again we all professionals know the parameters required for acquisition, technical processing, circulation, journals procurement maintenance of library resources and their preservation. Based on the library resources and services the programming need to be verified. While programming, the incorporation of IT professional takes the front seat. Because, doing the programming we will come across a lot of bugs. The more eyeballs we have but we swallow the bugs. Identifying the bugs is an arduous task in the part of the library professionals.

The KOHA community belongs to almost all the countries of the world. But we, Indians, have to know about the standards level aped adopted by BIS and what we studied in the Universities. The theory has to be converted to practice with local variations. KOHA feature is to be revised two to three times a year. Accordingly one has to migrate the database to the new version. This is possible in the libraries of HEIs as such libraries are provided with information scientist position who is from IT backgrounds. Here, we have to think of a school library where with minimum staff, the librarian has to manage the issue/ return, library class, resource management, service to the specially-abled readers, handle the non-book materials and organize programs for the school community same with college librarians with little higher responsibility with comparatively more staff. We discussed about the economic feasibility, the technical feasibility, the professional feasibility. One more problem lies with the infrastructure. The library staff, once are acquainted with the present software cannot make-up their mind for migration to a FOSS. We need to understand difference approves of implementation. Sometimes, it so happens that, due to administrative pressure, they migrate but due to many reasons, they cannot retire from the legacy software. The legacy software has also legal implication, as we spend a lot of money, human resources and months to develop the database; here comes to my mind that, The FOSS for ILMS will be needed for their application on O.S. The O.S., may need more than two application software and staff must know the commands to handle them. Handling new software, customizing the FOSS for ILMS, enhancing the workflow in the programs, being responsible for the security audit getting the data entries in the different sections, retro- conversion of the existing database and their preservation, putting on the website and satisfying the reader's community may be a dream for librarian's community. In many institutions, the top management change for various reasons and nobody knows how the new boss takes the case. The librarian's status and reputation is dependent on the reader's feedback. In the era of readers and more conspirators the librarian community never gets their required status in the organization. Therefore, the librarian community need to understand the practical implementation from a visionary point of view, so that the automation and digitization process would be sustainable with sustainable library resources and services, the librarian can move ahead for integrating more and more CAS(Current Awareness Services) and SDI(Selective Dissemination of Information) related

services, anti-plagiarism check, organizing training and extension program for the community and there aware of alert the schemes organizing/collaborating research cum development. The feasibility study plays a vital role and makes clear when we should make a travel or a quest. David Garvin states, "A learning organization is an organization skilled at creating, acquiring and transferring knowledge and insights."

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