

Emerging Trends in Open Source Software in Libraries

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Abstract

Purpose: *This study aims to investigate and analyse the emerging trends of open source software (OSS) adoption in library environments.*

Design/methodology/approach: *This paper was carried out through documentary analysis of various existing documents available on the web.*

Findings: *The study reveals a significant increase in the adoption of OSS in libraries. Libraries are recognising the advantages of OSS, such as flexibility, cost savings, and community-driven development, leading to a shift away from proprietary software.*

Research Limitations: *The scope of this paper is limited to exploring the trends and implications of OSS adoption in libraries.*

Practical Implication: *The use of OSS can be promoted in libraries.*

Originality/value: *LIS Professionals are encouraged to explore and experiment with OSS applications and even explore their own development paths.*

Keywords: *Open Source Software (OSS), Library Management System (LMS), FOLIO, Information and Communication Technology (ICT), Electronic Resources Management System (ERMS).*

Article Type: *Descriptive.*

1. Introduction: Open Source Software (OSS) has been gaining popularity in libraries for several years now. Major companies have adopted open source software in terms of usage and development, including Google, IBM, and Facebook. Now, this trend is extending to the library environment. Libraries nowadays must successfully allocate resources between established and emerging technologies, integrate both conventional and emerging formats, and develop innovative information management processes and procedures.

The development of the internet, the web, and information technology has created a wealth of opportunities for those in the library and information sectors, particularly in higher education. This study intends to offer useful insights on software options for educational institutions that are implementing digital library concepts. It provides helpful information for individuals trying to understand the variety of software options available for libraries, ensuring effective management and accessibility of digital materials in learning environments.

2. Literature Review: According to Randhawa (2008) in his article "Open Source Software and Libraries", users of OSS have the freedom to run, copy, distribute, study, modify, share, and improve the software for any purpose. With open source library software, there are no upfront expenditures like there are with commercial software, and libraries have more control over their working environment. Understanding the advantages of open source software and actively contributing to its development are essential for LIS professionals. They should be familiar with the basics of selection, installation, and maintenance processes. It's important to keep in mind that open source software requires more computing responsibilities than proprietary software. However, library professionals frequently ignore the benefits of open source software for automation and show resistance to its adoption.

Reddy, in his paper, explores that in the present digital era, libraries are increasingly relying on digitalized databases and electronic resources to manage and provide information services. However, libraries frequently find it difficult to embrace these technologies due to

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the high cost of integrated software and retrieval tools. Many NGOs, organisations, and individuals have created free or open source software that is openly available for download, installation, and distribution in order to address this issue and benefit library users and researchers. By offering solutions that are both inexpensive and configurable, open source software has the potential to transform libraries and information centres. Despite its drawbacks, open source software encourages collaboration and resource sharing while giving libraries more flexibility over their working environment. LIS professionals should explore the advantages of OSS, develop basic knowledge about its selection and maintenance, and actively contribute to its development (Reddy, 2013).

In Muir's 2005 article, the author went into the topic of OSS and offered insights into its features and usage. The article also examined the adoption of OSS in university libraries in Western countries such as the USA, Canada, and others. Muir highlighted that one of the core features of OSS is its ability to empower programmers with the freedom to alter the software and distribute their modifications. However, this comes with the condition that any modifications made must be disclosed to other developers.

3. Problem of the Study: The practice of developing software using open source is a recent phenomenon. In India, several libraries are concentrating on automation. However, the majority of them are unaware of the benefits and uses of OSS-based library software. The main trend among libraries and librarians is to either invest in proprietary software like SOUL, EBSCO Discovery Service, Ex Libris Primo Central, etc. or make use of freeware like CDS/ISIS. The decision-makers and LIS professionals do not have updated knowledge about the OSS. The problem is to research OSS use in various library environments.

4. Open Source Software: OSS has a rich history that traces back several decades. It was created as an alternative to the conventional proprietary software model, in which source code was kept private and under the control of a single organisation. The concept of OSS places a strong emphasis on the values of cooperation, transparency, and the freedom to use, modify, and distribute software.

According to Chouhan (2010), the history of OSS in a nutshell includes

- i) The Free Software Movement, started in the 1980s by Richard Stallman, served as the foundation for open source software.
- ii) The Linux Operating System (OS) was introduced by Linus Torvalds in 1991, and it quickly rose to prominence as one of the most successful and noteworthy examples of OSS.
- iii) The term "open source" was coined in 1998 during a meeting of industry leaders, aiming to provide a more business-friendly and less ideological label for free software.

The term "open source software" (OSS) refers to software that has been made available under a licence that allows users to freely use, alter, and distribute the source code. The phrase "open source" emphasises the openness and accessibility of the software's source code, enabling anyone to examine, edit, and contribute to its development.

"OSS is computer software that is released under a licence in which the copyright holder grants users the rights to use, study, change, and distribute the software and its source code to anyone and for any purpose" (Wikipedia, 2023).

"Open source is a term that originally referred to OSS. Open source software is code that is designed to be publicly accessible—anyone can see, modify, and distribute the code as they see fit" (RedHat, 2023).

OSS is both a philosophy and a process (Morgan, 2003). As a philosophy, OSS emphasises the principles of openness, transparency, collaboration, and community-driven development.

The philosophy of OSS focuses on the following key principles:

- i) Free Redistribution

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- ii) Source Code Availability
- iii) Permissive Licencing
- iv) Collaborative Development

As a process, OSS involves the development and distribution of software through an open and collaborative approach. This process typically involves the following steps:

- i) Source Code Development
- ii) Version Control
- iii) Public Repository
- iv) Community Contributions
- v) Community Review
- vi) Release and Distribution

5. Success Factors behind OSS: The success of OSS can be attributed to several key factors:

a) Collaboration and Community: Collaboration and community power are essential to the success of OSS projects. The open nature of OSS facilitates collaborative software improvement among a wide collection of contributors. This collaborative environment encourages creativity, quick development, and continuous improvement.

b) Transparency and Accountability: The transparency of OSS, with its publicly accessible source code, promotes accountability and trust. Users have the opportunity to examine and validate the code, ensuring the security, dependability, and quality of the product. Additionally, this transparency encourages users and developers to actively participate and contribute to the OSS community.

c) Flexibility and Customization: With the flexibility and customization options provided by OSS, users can modify the software to meet their own requirements. The ability to modify and extend the source code empowers users to tailor the software to suit their requirements, which leads to higher user satisfaction and adoption.

d) Cost Savings and Affordability: The cost-saving feature of OSS has been a key factor in its development. OSS is frequently freely accessible, which eliminates licencing fees and lowers total expenses for people and organisations. This accessibility makes OSS a desirable choice for people looking for affordable software solutions.

e) Rapid Evolution and Innovation: The collaborative and open nature of OSS enables rapid evolution and innovation. With a large global community participating in the development process, new features and upgrades can be introduced quickly. This adaptability allows OSS to keep up with emerging technologies and evolving user needs.

OSS has become a dominant force in the software industry, providing robust solutions that are trusted, adaptable, and continuously evolving.

6. Limitations and Considerations for OSS Implementation: While OSS offers numerous benefits, it also poses certain challenges. One limitation is the requirement for technical expertise to operate and maintain OSS systems effectively. When implementing OSS, libraries need to assess their available resources and consider training and support options. Another consideration is the availability of support and documentation, as OSS often relies on community-driven forums and user contributions. Libraries must evaluate the level of support they require and identify mechanisms to address potential issues.

7. Open Source Software for Libraries: OSS is software that is available to the public for use, modification, and distribution without any licence fees. This type of software is often developed collaboratively by a community of developers who make their work freely available for others to use and improve upon. Some of the recent trends in OSS in libraries are as follows:

a) FOLIO: FOLIO is an open source Library Management System (LMS) that offers integrated management of both print and electronic resources. It serves as a comprehensive

solution for various core library management functions. FOLIO is designed with a modern architecture to foster continuous innovation and adaptability. One of the key strengths of FOLIO is its support for the integration of applications from third-party providers. This allows libraries to leverage additional specialised tools and services within the FOLIO ecosystem, enhancing their capabilities and meeting specific requirements.

EBSCO, a prominent provider of library resources and services, offers implementation, hosting, and support services for FOLIO. This partnership ensures that libraries have access to reliable expertise and assistance throughout the implementation and ongoing maintenance of FOLIO.

b) Omeka: Omeka is a popular open-source Content Management System (CMS) primarily designed for building and maintaining digital collections and exhibits. It provides libraries, archives, museums, and other cultural organisations with an approachable platform to showcase their digital contents and make them available to the general public.

Omeka offers a number of capabilities that enable efficient cataloguing and organisation and exhibit many kinds of digital content, such as documents, images, videos, and audio files. In order to develop their collections, users can quickly create item records, add illustrative material, and upload digital materials. Additionally, Omeka supports multiple file formats and offers tools for embedding rich media and creating interactive exhibits.

c) VuFind: VuFind is a next-generation library catalogue developed by Andrew Nagy at Villanova University in 2010. It is written in PHP and utilises PHP PEAR and Apache SOLR for indexing MARC records. It is an OSS designed to provide a user-friendly interface for searching and discovering library resources. It is often used as a library discovery layer, allowing users to search for books, journals, articles, and other materials available in a library's collection.

VuFind offers a customised open-source alternative to the conventional OPAC or library catalogue. Its search interface is straightforward and user-friendly, featuring a single search box and a drop-down menu for searching all metadata fields. It incorporates web 2.0 features like tagging, SMS texting, comments, and allowing users to interact with the findings, which promotes greater user participation.

d) Global Open Knowledgebase (GOKb): It is an open-source project and collaborative initiative aimed at creating a comprehensive knowledgebase for electronic resources in libraries. It acts as a centralised database for accurate and current information regarding electronic journals, e-books, databases, and other digital resources.

GOKb provides a variety of features and functionalities to facilitate the management of electronic resources. It provides controlled vocabularies and standardised metadata schemas, enabling consistent and interoperable data. The platform enables the generation and management of holdings data, licence details, coverage information, and more.

e) CORAL: CORAL is an open-source electronic resources management system (ERMS) that helps libraries manage their electronic resources, including subscriptions, licences, and access information. It provides tools for managing renewals, tracking usage data, and streamlining vendor interactions.

Software development is a dynamic industry, and new projects and releases may have emerged since then. To stay up-to-date with the latest developments in open-source library software, it is advisable to consult reliable sources such as library technology websites, open-source communities, library associations, and LIS forums.

8. OSS Licence Issues: OSS licences are an integral part of the open-source movement, providing frameworks for the distribution, modification, and use of software. Open-source licences encourage cooperation and creativity, but their use might raise a number of problems. The following are some issues associated with open-source software licences:

a) Licence Compatibility: The terms and conditions of various open-source licences vary. It's critical to confirm that the licences of various open-source project components are

compatible with one another. While some licences may be more tolerant and make it simpler to integrate with other projects, others may place limitations on derivative works or call for conformance with a particular licence.

b) Licence Compliance: Open-source licences often come with certain obligations, such as providing attribution, revealing source code alterations, or making derived works available under the same licence. Legal consequences may occur if these conditions are not fulfilled. Open-source software users must have procedures in place to monitor and adhere to the terms of the licences they use.

c) Licence Proliferation: Open-source software is offered under a variety of licences, and the availability of so many licences can lead to confusion and complexity. To guarantee compliance and choose a licence that is compatible with their needs, developers and organisations must understand the various licences.

9. Role of Library Professionals and Future Directions: Library professionals play a vital role in advocating for and implementing OSS in libraries. To ensure successful integration into library operations, they must have a basic understanding of OSS selection, installation, and maintenance. Additionally, cooperation between libraries and the sharing of best practises can help OSS projects in the library community expand sustainably. Future studies should concentrate on OSS solutions long-term durability and scalability in libraries, as well as the development of a more powerful political voice for libraries in discussions about technological democratisation.

10. Conclusion: OSS has gained significant popularity in libraries, offering a range of software options for effective management and accessibility of digital materials. The success of OSS can be attributed to factors such as collaboration, community, transparency, flexibility, customization, affordability, and rapid innovation. However, the use of open-source software licences can present challenges. To navigate these licence issues, individuals and organisations should have a clear understanding of the licences they use, maintain proper documentation, and establish compliance processes. When necessary, seeking legal counsel can aid in ensuring compliance with licence requirements. OSS provides libraries with potential opportunities for efficient and economical management of digital resources, fostering collaboration, creativity, and personalization. As the field of software development continues to evolve, staying updated with the latest OSS developments through reputable sources is essential for libraries seeking to leverage open-source solutions effectively.

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