

Information Specialists' Use of Open-Source Software in Saudi Universities

Dr. Yaser Mohammad Mohammad Al Sawy

Associate Professor of Library and Information Science - College of Education and Arts – General Curriculum Dept.- Northern Border University - Saudi Arabia. ORCID ID: <https://orcid.org/0000-0002-3150-949>

Summary

The study aimed to identify open-source software available in libraries and information centers by identifying the most important types of integrated automated systems in open-source libraries and repositories in addition to open-source archive systems. The researcher was keen to use the survey method to identify many types of open-source software that are applied in libraries and information centers, and the study also followed the analytical approach through various sources to analyze and study the available open-source software, and the study reached specific and clear results stating that open-source software is one of the most important systems that must be relied upon and used due to its free use and comprehensiveness of working with it by all beneficiaries, in addition to the high reliability of the quality of that software, and its provision of many solutions that facilitate the processes of storing, retrieving and disseminating information, in addition to its conformity with other programs in programming language and design and performance integration. To work either on the scale of integrated library management systems, or as warehouses Digital for storing, retrieving, and disseminating information, or as a format for preserving data, including information, photos, and documents in the form of electronic archive systems.

Key words:

Open-source software; Open-source software for libraries; Library Integrated systems; Open-source Repository; Open-source Archive systems.

1. Introduction

The term open-source software refers to initiatives that include and celebrate the principles of open exchange, participation, rapid prototyping, transparency, and community development. This matter is an interactive feature in the programs that use it, so we depart from the norm and leave the culture of consumption and strive towards creativity, as open-source software is distributed with Source code that can be read or modified by users, unlike traditional software distributed in a compiled, immutable format, and open-source software is delivered with both bundled and non-compiled formats, allowing for open code modification [1].

Where the open access movement is gaining significant support in countries facing restrictions on access to large resources or shrinking subscription to journals or research and development budgets, open access is a critically important value for institutions, authors, and others who use the Internet to publish

different types of literature in the world for free. Open access is simply making research available for others to read without having to pay for it, however, it does not give the user the right to make copies, distribute or modify in any way beyond fair use. However, open access does not mean that research is only available for free, but it goes on. Further, by granting users additional rights, through a Creative Commons license, so that people have the freedom to reuse research, and in this sense, the open-source movement needs to radically reformulate the copyright law to create high-quality programs that ensure the public can use and develop them [2].

Open-source software allows programmers to collaborate in improving the program by finding and fixing bugs in the code, updating the program to keep pace with new technology, and creating new features, as a team collaboration approach for open-source projects benefits program users; Because bugs are fixed faster, new features are added and released more frequently, and programs are more stable with more programmers looking for errors in the code, and security updates are executed faster than much proprietary software that does not allow modification. Therefore, benefiting from the experience of programmers who use this software and enabling them to develop it is the main goal of the existence of this software [1].

Therefore, through free access, researchers and students from all parts of the world can have greater access to information, increase dissemination and multiply the potential impact of research. Increased access to and sharing of information has the effect of enhancing opportunities for economic and social development, consolidating intercultural dialogue, and encouraging innovation.

2. Research problem

The use of open-source software in libraries and information centers has become a phenomenon that cannot be overlooked and with the presence of many programs that work to manage all operations in libraries and information centers, there is a need to know the suitability of these systems for use in libraries and whether they can represent an alternative to commercial systems, especially with The lack of clear standards for these programs that can be relied upon in the selection process and the discrepancy between one system and another, as a result of these systems being developed by the individual efforts of some

librarians and programmers and not relying on codified standards for that

3. Research importance

The importance of the study stems from the fact that open-source software provides the source code and thus developers can improve it to adapt to individual needs. Errors and security gaps can be discovered and corrected easily and quickly through the cooperation of programmers, so no company with a commercial orientation can bring in this huge number of software developers.

There are also no rights to distribute applications, source code modifications, and improvements available to everyone, and therefore any user can modify the source code, meaning the quality of the programs is continuously improved, and there are no exclusive rights for the programs, which means that open-source software is available to everyone, and a programmer or company cannot determine the method or The mechanism that should be followed by software development.

4. Research objectives

This study aims to achieve the following:

- 1- Learn about open-source software.
- 2- Realizing the importance of open-source software and its types.
- 3- Identify the open-source software used in the automation of libraries.
- 4- Comparison between the characteristics of the most prominent open-source software in the currently available libraries.

5. Research Methodology

The study used the survey method to identify open-source software. The study also followed the analytical method to test the available open-source software and develop a set of criteria that can be used to evaluate that software [3].

6. Research terminology

6.1 Open-source software

They are free programs available for free with their code with the possibility of modification, and thus it is a new type of software, which can be obtained free of charge via the Internet, and this software provides the source code while allowing this text to be read, distributed and modified.

6.2 Open Access Repositories

The beginnings of the twenty-first century were marked by a significant increase in the number of libraries and digital repositories around the world, and there is no doubt that open access to these repositories enhances scientific communication and seeks to solve the problem of lack of access due to financial restrictions in addition to other factors such as geographical barriers, political barriers, etc. till then.

6.3 Digital repositories

It is a collaborative work on the Internet to collect and preserve the academic scientific output of institutions and research

centers, to enable it to form a collective memory that is characterized by accumulation and long-term conservation.

7. Literature Review

Where the study aimed [4] to reach best practical practices for evaluating open-source programs for use in all projects related to libraries and information centers, as this comes based on the accumulated experience of authors and researchers in evaluating many solutions around electronic publishing, he added. Therefore, the study sought a brief review of the literature in the specialization, focusing on the need to evaluate several open-source software solutions, as they were carefully formulated and conservatively to reduce the total cost of intellectual property. The study also describes the processes used to conduct a comprehensive evaluation of the publishing system. The electronic format is in an open-source format, with many methodological aspects highlighted. The study concludes with a discussion and a comprehensive presentation of the evaluation results for presentation to decision-makers.

The study sought [5] to review a lot of library automation packages available in the form of open-source software, which consists of two main units: the library staff unit, in addition to the online general access catalog, although this private access is package oriented Automation of libraries, which provides advanced features to search for and retrieve all bibliographic records in an organized manner, some of them facilitate full-text searches, as most of the digital library programs that fall under the open-source domain facilitate indexing of full-text documents, as well as searching them according to many different formats, and in this context, this study seeks to enable full-text search features in the Koha package for large-scale open-source library automation, through a process of merging with two packages of open-source digital library programs.

The study provides [6] a comprehensive review of the beginning of the creation of digital archives and digital library projects for many materials of different shapes and fields for the operations of organizing, storing, and retrieving digital contents, in addition to accredited archiving centers that use private or open-source programs for both digital and print media, so that digital media requires a set of continuous processes to maintain its compatibility with digital technology.

8. The historic founding of open-source software

The history of open-source software goes back to the early stages of the emergence of electronic computers and software development. At that time, programmers and developers often shared their programs freely, but in light of companies' desire to develop software to make a profit, the culture of participation began to shrink. Which in turn affected the traffic of access to this software [1].

8.1 Open-source software for libraries and information centers

There is a close link between open-source programs and the library community and information centers, both of which represent a free culture, and in this context, the use of open-source software in libraries has become an inherent phenomenon in the presence of many programs that can work

to manage all operations, which prompted many libraries to raise The library database is on the Internet, and work to ensure that all units are web-based and network-centered [7]. So that users can see the contents of the library from home or locations far from the physical entity of the library. Likewise, library workers can enter data from different and remote locations, If libraries continue to maintain their databases and their website on a local network or one device, they will lag behind others, and in this regard when we talk about libraries that work to develop themselves for survival over generations, programs with open-source software will be those ideal programs for libraries, and they are the ones that It will remain its developer over the generations so that it is not only the survival of individuals but rather the continuous development of the program with new requirements and according to the best technician Available at the right time [2].

8.2 The open-source web repository directory

Digital repositories through open access established a new trend for scientific communication globally [8], as the need for widespread access to scientific data to publish research results and reduce prices related to the cost of scientific journals, coupled with shrinking budgets, opened the way for the emergence of a strong scientific movement aimed at open access to all digital scientific materials [9].

Where the open-source repository directory was launched on the Internet, which was initially developed in collaboration between the University of Nottingham and the University of Lund, the Open-source Repository Directory is the high-quality global directory of academic open access repositories, allowing for the identification, browsing, and searching of repositories [10].

8.3 Technology and its impact on the concept of accessibility

In the late twentieth century, information and communication technology became one of the most important factors of empowering citizens around the world in all sectors. Openness, access to, processing, and dissemination of research information has become easily achievable due to the spread of information and communication technology and services that support information and communication technology. The early use of computer scientists of the Internet is a gesture of real free use, as they made their research available for other computer scientists to use, build on and develop, and despite the prevailing belief that academic research is used mainly by scientists and academics, other parties benefit from this research. In addition to independent researchers, professional societies, practitioners, and the industry and commerce sectors [11].

The availability of information and knowledge resources and tools are central tools for democracy and participatory society, and the idea of democratizing information and knowledge enjoys a lot of momentum and importance in many international forums, which makes this idea present in most efforts aimed at bridging the gap between knowledge and the digital revolution. Which requires positive interventions by influencers, decision-makers [12], bodies, and active institutions in societies, to harness global initiatives related to facilitating access to information and knowledge, making open-source software, open research literature, open standards, open

innovation, and open research data within the reach of researchers, students and individuals, In sum, it can be said that these interventions encourage a departure from the norms and abandon the culture of consumption and the pursuit of creativity.

8.4 Open-source software standards

Availability: The program services and all their versions, along with any new additional features, must be available in the market.

Reliability: where reliable open-source software should be designed to be as fault-tolerant as possible, fault tolerance means supporting system functionality in the presence of errors. Performance: the most important feature is; So that all open-source software seeks to achieve the best performance so that it is easy to install, and to operate quickly.

Usability: so that it leads to the possibility of learning, operation, and accessibility, in addition to the ability to learn and understand the program easily and there may be no need to use the user manual due to the ease of access that leads to the programs that are easily accessed without the need for any additional third-party programs.

Functions: so that the functions include fulfilling the expected requirements of the user, correcting the outputs as per the user, and verifying that the program works appropriately as needed.

8.5 Open-source software in libraries

There is certainly a great diversity of open-source software available for libraries of this diversity due to the presence of many services that may need special software that can serve this field, so we find that there are four main categories of open-source software used in libraries, which are as follows: [13].

- 1- Software used in automation operations.
- 2- Software used for value-added operations.
- 3- Software used for digital library initiatives.
- 4- Software to support office operations.

The most important open-source Library integrated systems

The most famous of these systems and their characteristics can be reviewed as follows:

8.5.1 Symphony system

Symphony supports a variety of collaborative lending solutions between libraries as Support for NCIP, Includes the 9XX ordering suite: maximizing flexibility in the material acquisition by eliminating frequent entry; [14] Online execution of supply orders through supplier/bookseller websites and upload data, also Includes the Director Station, which includes a web-based performance dashboard that can be customized according to the director's individual needs; And allowing viewing indicators to measure the operational performance of the library [15].

8.5.2Koha system

Koha is considered the first integrated open-source system in libraries to be used by libraries in the United States, New Zealand, and Europe. The first version of the system was released in 2000 and is being developed by a large number of developers interested in open-source software [16], and the Koha system includes A group of subsystems, namely the index,

management, personnel subscriptions management, and provisioning [17].

8.5.3 NewGenLib system

The system is considered one of the famous open-source systems used in libraries, as this system was developed as a result of the cooperation of a group of institutions working to support information technology in India, and the first open-source version of the program was released in 2007 under the GPL license, and the system allows a group of Subsystems which are circulation, acquisitions, periodical control, indexing, system administration, direct line index and reports.

8.5.4 OPALS system

It is one of the open-source systems used in more than 1000 libraries around the world, whether school, academic or public libraries, as the system allows many distinct functions that compete with many other commercial systems from lending, inventory, direct line indexing, and preserving digital content, whether read or audible materials.

8.5.5. DSpace system

It is a digital warehouse management system that enables users to send electronic documents and then describe them, and the system indexes and stores them and contains a unique retrieval and search system to access these documents.

8.5.6 Greenstone system

Preparing a software package for building the collections of the digital library and distributing its holdings, so that the program gives an innovative way to organize information and publish it on the Internet or CD-ROM [18]. This program is developed by the New Zealand Digital Library, and the distribution is in cooperation with UNESCO and the Humanitarian Information Society. It is one of the most important open-source software.

8.5.7 Joomla system

It is one of the open-source systems for managing digital content on the Internet, and it has many advantages as it provides copying pages to print on paper and search through several search engines and work to support different languages, and the first version of the program was issued in 2007, as it was issued. The last version, in 2011.

Electronic Archiving Systems (DMS) [19].

A system is a computer form that is used to track and store electronic and digital documents and images of traditional documents, and it is often able to track many different versions of documents that have been uploaded by many users.

8.5.8 Openkm system

One of the open-source systems designed to save and organize documents electronically in large and small organizations, the first version was released in 2005 and so far five versions of the program have been released [20], the last of which was in 2010.

8.6 Open-source systems evaluation criteria for library management

1- Choose the automatic system.

2- Available financial sources.

The process of choosing an automated system is one of the most important processes for the success of implementing this system, as the success or failure of the application of the integrated automated system depends on the extent to which the accuracy and standards are observed in the selection process, as many problems appear after the system's implementation for a period, which ultimately leads to the replacement of the system, so the selection process depends The system is based on setting a set of determinants that contribute to identifying the most appropriate system for the library [19], Two determinants can be identified on which the application of an automated system in the library can depend, namely:

The general needs and requirements of the library [20,21].

8.5.99. The study sample

Table 1: shows the distribution of the individuals of the study sample by university

University	Frequencies	Percentage %
Northern Border University	12	15
Tabuk University	8	10
Princess Nourah Bint Abdel Rahman University	12	15
Hail University	8	10
King Khalid University	14	17.5
Taiba University	10	12.5
King Abdel Aziz University	16	20
	80	100

Table 2: shows the distribution of the individuals of the study sample by gender

Gender	Frequencies	Percentage %
Male	44	55
Female	36	45
Total	80	100

A review and correction questionnaire was prepared and distributed to the study sample consisting of 13 main questions, the answers were according as the following:

Table 3: showing the validity of the correlation of the questionnaire statements

#	Statement	Pearson Correlation Coefficient (PCC)
1	Availability of open-access software in the university library	**0.457
2	The modernity of open source software in the university library	**0.468
3	The Availability of an integrated system for managing the university library	**0.645
4	Availability of an integrated digital storage system	**0.487
5	Availability of an integrated system for digital archiving	**0.598
6	Availability of periodic training for university library staff	**0.569
7	Open-source software is an important enabler of scientific research	**0.678
8	Open-source software is one of the academic achievement possibilities	**0.733
9	Open-source software enables easy processing of documents	**0.617
10	Open-source software has several advantages over disadvantages in the use	**0.583
11	The open-source software enables integration with the digital environment	**0.635
12	Open-source software affects the ability to perform technical operations faster and more accurately	**0.785
13	There is a sense of job satisfaction when using open source software	**0.548

The previous table shows that all the questionnaire statements about the use of open-source software have a positive correlation, ranging from a medium degree to a high degree, but in any case, they do not rise to a very high degree, and this reflects that all the statements are correct, and they represent and express the part. To which it belongs, and interprets the internal validity component of the questionnaire.

10. Results

The study provided specific results, the most important of which lies in the fact that open-source software is one of the most important forms of software used in the digital environment because it is freely available and open to all so that it reduces the cost value for both the beneficiaries or the operators alike. An important feature of this software is because of its availability for source coding, which can be modified and worked through it on the permanent development of that software mainly, allowing re-design and expansion in use, and in libraries and information centers open-source software provides the ability to use on a large scale and comprehensive for many Categories that want to obtain information free of charge, which increases the ability to scientific research and information circulation, and publishes it among all beneficiaries without additional cost to either the libraries or the beneficiaries, in addition to that, the study has concluded that this software has a tremendous amount of quality in design And security, which gives it reliability, effectiveness, and sustainability in use, as well as the ability to maintain and re-develop. Thus, the study concludes that open-source software is one of the reasons The libraries and information centers have succeeded in providing their services in an integrated manner to many groups with high efficiency and the ability to keep pace with digital use.

11. Recommendations

The researcher recommends the following:

- The importance of expanding the use of open-source software in libraries and information centers
- Ongoing training for library professionals in operating open-source software
- Continuous update and maintenance of open-source software
- Mainstreaming integrated automated systems in libraries based on open-source software
- Mainstreaming digital repositories to store, preserve and retrieve information in the digital environment
- Use of open-source software based archiving and information retrieval systems

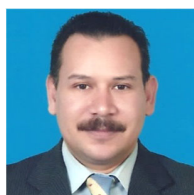
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Yaser Mohammad Al Sawy-
Associate professor of Library and
Information Science, College of
Education and Arts – General
Curriculum Dept.- Northern Border
University - Saudi Arabia, Advisor for
the vice presidency, Advisor for the

Deanship of Scientific Research, Advisor for Kuwait
Institute for Scientific Research (KISR) (Kuwait), Director
of Acquisition Unit at Arab Open University (Kuwait),
Information Specialist at Awqaf Public Foundation
(Kuwait).