

The Role of Open Source Software to Create Digital Libraries and Standards Assessment

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Abstract

Open-source software developments are basically Internet-based communities that voluntarily collaborate in developing software on the Internet and such Internet communities have become an important cultural and economic phenomenon. As a result, the emergence of open-source software has presented a challenge to the traditional offerings by providing free alternatives. The objective of this article is to review the possibility of the adoption of open source software in the creation of digital libraries, highlights advantages and disadvantage preservations. Among our objective also explaining the request of such software at the present time and the criteria evaluated in the digital preservation through surveying the best open source software from the reality of intellectual production, and standards that are being built to evaluate and choose what software to create a digital library without other software available. To achieve the above objectives, we shed the light on the top 11 open-source software to manage Libraries in addition to standards that may represent the basic building block for the selection of the appropriate systems to the needs of the digital library. This article relied on the descriptive approach by reviewing a series of studies and scientific research works related to the subject of the current study. Accordingly, the most prominent of the findings of this work is its illustration of the close association between open source software and the library community, both of which represent free culture. Also it is shown that the selection process of open source software has some obstacles most notably as there are no clear and reliable criteria for selecting these systems. Current study has concluded a set of recommendations, notably awareness of the role and importance of open source software and the facilities it provides in managing digital content.

Key words: *Open source software, Digital libraries, Software, Open source, Open source systems and Digital environment.*

I. Introduction

Open source Software allows libraries for effective ways to improve their services in terms of cost. The

importance of the use of free and open source software in libraries to the striking similarity is striking between the objectives of both the library and open source.

The library offers its services to all members of the community free of charge, it does not aim to profit but it aims to provide information for the growth of the knees of civilization forward, as well as reservation of intellectual property rights of the owners of the literature, as well as new rights for new authors and help people to get the information to the greatest extent possible and that they cannot get them on their own.

The use of open source software in libraries has become a phenomenon that cannot be overlooked, the presence of many software that works to manage all the operations in the libraries have become there is a need to know the suitability of these systems for use in Digital libraries.

Identifying early success is important for the continued development and growth of the open-source movement [1].

We will review in this study is presentation on the possibility of the adoption of open source software in the creation of digital libraries, highlights advantages and disadvantage preservations, also the need for such software at the present time and the criteria evaluated in the digital preservation.

II. OPEN-SOURCE DEFINITION

We can define open source software as Open Source Software provides software coded source software under a license that allows to study and change and improve the software itself for end-users. Open software-based source on the open-source philosophy, a developmental way for software significantly benefit from the distribution operations and the transparency of the work between all the parties, where this philosophy is committed to the program so defined as an open source must provide a number of conditions including: freedom of redistributing the program provides the source code of the program text, and free distribution of the source text, and freedom of production is

derived or modified from the original software program, and freedom distributed under the same license of the original software [2].

Originated the term open source software, after Netscape Communications Corporation decided in January 1998 and a final step for the survival of the internal source launches the browser Netscape, which lost the bet with Microsoft's Internet Explorer browser Microsoft Internet Explorer so that it is available for study and development to everyone, after the announcement; the thought of a group of hacker Free Software Free Software Hackers, led by Eric Raymond (Eric Steven Raymond) ESR, a new marketing way of free software in the corporate world and business. The real problem in their eyes is not in the philosophical foundations of free software; but in the word Free in that they obscure. Do you mean it's free of charge with no or it's free to edit anyone? As is known to all that the terms have a significant role in the marketing and propaganda, so the word Free does not fit the developers and companies used the technique because of its inherent ambiguity in meaning [3].

So came a new term called the "open source" where they stated that open source is a development method for software so that they provide the source code it can be available free of charge material or paid. This method is characterized as being flexible because the program source available to the thousands of developers who have the flexibility of liberalization and development of the program to suit their specific needs, which is also a creative way because it is a developmental participatory where developers share their ideas over the Internet and through the reality in the developmental meetings. As well as the advantage of reliable because thousands of developers test them and repairing the ills that out effectively and fast. What distinguishes it is also that the development at the time faster so that they engage the community in the tests and receive repairs and features other than traditional commercial approach [4].

When this term came out of the media met broad acceptance among those interested in all the sectors related to information technology, and especially as it is hyped developmental as an effective means of production, which showed the results of this media campaign in many respects, it is in terms of software and applications considered all the famous free software is open source software such as program Firefox and Apache software Foundation (ASF) [4].

It is the digital content area mega projects believes the principle of open source of information and must be provided for all appeared, and perhaps the most famous of these projects is the Wikipedia project, the Encyclopedia shared by all in the editing and developed available in all languages, and is one of the most famous sites in the world of the Internet [5]. It is amusing projects in the world of open-source is Open Cola Cola project, a project for the

production of soft drink like Coca-Cola and Bouapbsa but it described as open and developed by shareholders and volunteers from all over the world. Since all companies producing soft drinks keeps secrets mixes drinks as trade secrets do not disclose them at all, and this project came to break this monopoly [6].

III. FREE SOFTWARE AND OPEN SOURCE SOFTWARE

As shown in the open software definition of the source and its conditions, they do no different from free software, but it shows the radical difference is that open source software is a technology movement of professional software development, the one who, it is widely popular among businesses as a way to produce the best products thanks they involve community in production and manufacturing, the idea of open source professional drawn attention does not always commit to freedom for the user if conflicted with the interests of the company. While free software is a social movement concerned with editing users from the restrictions imposed by the companies they started in the first place, not so much interested in the fact that the product is free of the product provides more free features, because they see the freedom of the user before everything.

Says Richard Stallman Richard Matthew Stallman (RMS) [7] stubborn advocate of free software and its founder in the incontestable within the open source: "Fear of Freedom: The main motive of the term" open source "is that the ethical principles of" free software: make some people upset. The fact that: talk about freedom, and ethical issues, as well as responsibilities in addition to the personal interests requires thinking about things they might not like it, such as going into a moral discussion toward a certain act. This may cause a nuisance; some have closed their ears to listen to him. This does not mean that we should stop talking about these things. "

Fear Stallman that the software usage of the term open source deprives users to know the real reason behind the development of free software and deprives them of the ability to respect the freedom of software, where he says [8]: "the philosophy of open source with its purely practical advantages impede understanding of the principles of the deepest free software, which led a lot of people into our society, but they did not teach them to defend freedom. this is good to a certain extent; but it is not enough to make a safe freedom. attract users to free software only lead them to the middle of the road for their defense of liberty. "

What is meant by the concept of open software from the researcher's point of view is intended freedom of software users to run, copy, distribute, study, change software.

IV. THE TERM FREE SOFTWARE AND THE FOUR FREEDOMS OF USER NAMELY

The term free software specifically refers to the four freedoms of the user namely:

A. Freedom to use the program for any purpose: where you can use the software for any purpose whatsoever. However; Stallman found that there are some governments and companies that prevent the user from running programs for specific purposes in contravention of the principle of freedom [8].

B. The freedom to study and modify the source code of the program: there is nothing can hide the programmer or developer for the consumer; it also can customize the program by adding new features desired by, while others criticize this freedom, the assumption that it may cause a security breach, where can some access to the source code and discover gaps and exploit badly.

C. The freedom to distribute copies of the original software to be able to help others: that the final consumer copying and re-distribution program for non-guaranteed.

D. The freedom to distribute modified your copies of the program and share your modification to everyone: ensuring the ability to deploy modifications and distributed without restriction.

Drawn attention and realistic of the current situation; most companies operating in the production of free tracking software open source approach because it fits their needs, and most famous of these companies' Red Hat company months and the largest company that produces free specialized in hand servers Software [9], Inc. Kanicol producers of Ubuntu months GNU / Linux dedicated to end users.

On the other hand, some way decided to please everyone that is called a term that combines Monday, a free software and open source as a shortcut to him FOSS, which won the satisfaction of many governments and institutions because it combines the two parties together, and also provides a code word united easily traded in the media and official documents, a term which I think it is suitable for use today.

V. TOP 10 OPEN SOURCE SOFTWARE FROM THE REALITY OF INTELLECTUAL PRODUCTION

Digital preservation as a Digital Archive for the production of intellectual organization or institution, which makes the production of knowledge for organizations available within the reach of others all over the world via the Internet, and can say that digital preservation is a set of services provided by the university or institution to the members of her community to manage and deploy digital materials created by the institution and the members of society, it is extremely important obligation to oversee and systematically digital materials and saved on long-term

long-term preservation, and to ensure the effectiveness of digital preservation necessarily requires the creation of cooperation between libraries, specialist information technology, and the role of the archive, and directors of universities institutes and faculty members, and policy makers [10], With the advent of digital libraries projects and also the digital preservation projects, many developed countries and public institutions in the world, it has decided to maintain The wealth of knowledge in the long term through digitization initiatives Digitization and digital preservation projects, as there are a variety of cultures and multilingual contents currently being documented and saved depending on the open-source software available and acclaimed internationally in digital preservation and build digital repositories [11].

The following is a presentation of the best open-source software, which is used to create a digital library where he was selected as the best programs according to what was published in the intellectual production output, Besides the system supports the Arabic language, and will not overlook the importance of easy to use interfaces and support for global standards agreed internationally, it is as follows:

1. Program Koha

Koha program is the first open-source integrated library program Open Source Integrated Library System (ILS), used widely in different parts of the world. The program was developed by the Federation of the library community's growing Community of Libraries Collaborative, in order to achieve the technological goals. The program provider distinct possibilities make it able to meet the growing needs of the user, as well as flexibility in the expansion and development, and distributes software under General License Agreement (General Public License (GPL, and has all the basic features that you need libraries to manage their holdings, namely [12];

1. Subsystem for indexing Cataloging.
2. subsystem loan of Circulation.
3. The index is available on-line OPAC.
4. Subsystem for Supply Management Acquisitions process.
5. Budget Management library automatically.
6. Book sources through the index available on-line, and a lot of other functions.

2. Greenstone program

Greenstone software is open source software package was released in accordance with the provisions of general use license General Public License (GUN). The program allows a user interface familiar Multilingual operates under the multiple Multi-platform operating platforms, and by which they can assemble documents in digital collections and dissemination via the Web or on CD-ROM CD-ROM. The program expands to store a large collection of digital documents, and supports standards descriptors Metadata Standards data for indexing of digital documents, such as

standard (OAI) Open Archive Initiative- Protocol for Metadata Harvesting, also supports standard Z39.50 information retrieval, as the software is able to convert full-text databases Created in CDs / ISIS digital library environment [13].

The Technical characteristics of this software:

1. flexibility, durability and ease of use.
2. free access to it.

All this would increase the use of the software and its application in building digital libraries projects on a large scale in the field of education, and increases the chances of learning librarians and information specialists Information Specialists of the concepts of digital library.

3. Aabrentis Eprints program

Is an open source software developed at the University of Southampton Southampton, England, and the most prominent digital repositories that use this program: the warehouse of the Indian Institute of Science Eprints @ IISC Repository, where the warehouse to collect, preserve and disseminate all digital formats Digital Formats that have been created by researchers of Institute of Science Society Indian IISC [14].

The Technical characteristics of this software [14]:

1. This program can also be community institutions deposit of publications and papers and other academic publications through the Web interface is easy to use standard Web Interface.
2. The possibility of regulating these publications easily retrievable manner.
3. can access the repository Eprints @ IISC by anyone.
4. provides research documents used exclusively for the research community's only this Institute.
5. uses this warehouse program Eprints Open Archive, which are distributed free of charge through the website Eprints.org.
- 6- Eprints software is compatible with the principles of the Open Archives Initiative (OAI), which allows for prints and publications to be easy indexing and cataloging by web search engines, and other indexing services.

4. DSpace program

Is an open source software package that provides a set of tools for managing digital assets, which is the most widely used option to build digital repositories for academic institutions, due to the flexible structured adjustable to meet the future needs of users. The DSpace software development through Macisoc Institute for Science and Technology AIT Inc. Hayotbekrd HP through a grant from HP company in 2000, was the first version to the public in 2002, issuing a Dspace V.1. 9, the program

assists in creating and indexing and retrieval of all forms of digital content, and enjoys a high in agreement to work with most operating systems, as the program is committed to international standards for metadata Standards [15].

The Technical characteristics of this software [15]:

1. Completely Arabization by Umm Al Qura University in Saudi Arabia.
- 2 runs on Windows and Linux environment.
3. The global coding system UTF-8 support.
- 4- OAI-PMH protocol support for the exchange of information.
5. supports Handle.net system to save the addresses with the domain name change.
6. restructuring the system flexible enough to allow the allocation of many of the actors and the construction of many groups.
7. agree Dspace system with a range of database management systems and are advised to use PostgreSQL system which is the base that was used.

5- As Fedora program

Fedora is a program of the Free Software Innovation Center open source, where this program was able to attract a large number of developers and open source lovers around the world. Now the Fedora community contributes to the development of this program in order to make progress is significant in the field of open source software available.

Fedora runs a program in Linux environment Linux is open source a safe, stable and easy-to-use management and work environment [16].

6- PhpMyBibli system

Is a modern system for the management of libraries where the first copy of which was launched in 2002 by a French project to one of the librarians (François Lemarchand) to support open source software licensed under the CeCIL license for software and open source program was the latest version launched in 2008 with the release of periodic updates to fix flaws that appear in the system.

The system features a range of sub-systems are loan, cataloging, selective broadcasting of information, a sub-system for the management of the library and supply [17].

The Technical characteristics of this software:

1. Easy to use interface allows for all operations easily and without the need for any experience.
2. Barcode generator.
3. compatible with global standards Description bibliographic MARC-21, MARC-XML, z39.50, SRU / W, OAI-PMH.
4. Supports standard search and retrieval Z39.50.
5. allowed to take backup copies of the files on the system.
6. Support many languages including Arabic.

7- OPALS system

Is a systems open source used in more than 1,000 libraries in the world, whether a school or academic or public libraries where the system provides a number of unique functions that competes with many other commercial systems of secondment, inventory and catalog direct line and save digital content, whether material read or heard [18].

The Technical characteristics of this software:

1. does not require expertise to install the software there are many hosting companies that provide hosting and install the software and technical support.
2. many of the functions that are not available in many offers from other open source systems, as it is used in all types of school, public and academic libraries
3. Supports standard search and retrieval Z39.50.
4. Supports standard indexing machine-readable "Mark."
5. Support the establishment of warheads Special topics library during the indexing process.
6. supports the Arabic language.

8- NewGenLib system

NewGenLib system is a system open famous used in libraries source where This system was developed as a result of cooperation of a group of institutions working to support information technology in India was the first open source version of the software version in 2007 under License (GPL) system enables a group of subsystems a loan, supply, adjust the patrols, indexing, system administration, direct line and reports an index, and states the main site for the program because they are using the program of more than 2,500 libraries in 51 countries around the world [19].

The Technical characteristics of this software:

1. System support a large number of languages to 51 languages including Arabic.
2. Supports standard search and retrieval Z39.50.
3. comply with the standards of bibliographic description of global MARC-21, MARC-XML, z39.50, SRU / W, OAI-PMH.
4. supporting the RFID system (radio frequency identification).
5. Instant Messaging support through the system.
6. Support for multiple levels of protection for the system.
7. support multiple operating environments, and because the system is built using the Java language.

9- Joomla system

Is an open source management of digital content on the Internet, and has several features including; provide copies of pages to print on paper and RSS feeds, research and support for different languages, released the first version of

the program in 2007 and the latest version in 2011, a 1.6 is designed in PHP and enjoys the inter a significant share of web sites by 2.7% of the web sites and software issued under the GNU General Public license [20].

The Technical characteristics of this software:

1. support Windows - Linux - Mac -Solaris -FreeBSD different operating platforms.
2. the full support of the Arabic language in addition to a wide range of languages.
3. Ease of installation and use.
4. support many features like RSS and additions to print Web pages.
5. BB adding support Javascript.
6. Compatible with a variety of database management systems and are advised to use MySQL system.

10- Xinco system

Open source document management was developed at the University of joint education in Germany using the Java language issued last version in 2010 (2:00:04) program is to manage documents as well as files Texts and addresses of Internet sites are currently under way to try to translate to many languages such as Polish and Czech [21].

The Technical characteristics of this software:

1. Support for the two main languages English and German with the possibility of translation system of any language easily.
2. works on Windows operating platform and all its versions.
3. Ease of installation and use with the availability and use graphical interface.
4. The program supports indexing the full text of the documents available in its database.
5. support many file formats PDF, MS Word, MS Excel, HTML.
6. Many of the advanced research methods provides for easier access to the documents.
7. Compatible with a variety of database management systems such as MySQL and PostgreSQL.

11- OpenKm system

Openkm system is a system open designed source to save and organize documents electronically in large and small enterprises have been put up the first version in 2005 and released so far, five copies of the program, most recently in 2010, the program shall be issued under the GNU GPL license and the program is designed in Java that allows him to work on any operating environment [22].

The Technical characteristics of this software:

1. Arabic language support, along with 27 other languages.
2. support different operating Windows - Linux - Mac - Solaris -FreeBSD platforms.

3. Compatible with a range of data base management system also supports the use of more than one database at the same time, such as MySQL and PostgreSQL.
4. built-in digital scanner to pull the documents.
5. Full support for all image formats and documents also supports PDF format.
6. Supports all available Internet browsers.
7. ease of installation, use and availability of technical support.



Fig.1 Digital and web content management software

VI. CRITERIA FOR EVALUATING OPEN SOURCE SOFTWARE FOR LIBRARY MANAGEMENT

Open source software evaluation criteria can be defined in three categories: general parameters of the library, general parameters of the system and technical parameters of the system, as shown in the following figure:

The general determinants of the library	General parameters of the system	The technical parameters of the system
<ul style="list-style-type: none"> • Human resources available for the library. • The financial resources available for the library. • The needs and requirements of the library. • Type and size of the library. 	<ul style="list-style-type: none"> • Flexibility. • Harmonization. • Easy. • Seizure control. • Stability. • Costs. 	<ul style="list-style-type: none"> • Adherence to standards and standard specifications.

Fig.2 Determinants of choosing open-source software

The three special categories of open source software evaluation criteria are explained below:

• First, The general determinants of the library:

1. Human resources available for the library: The number of workers in the library and their own experiences as it may be useful to a programmer's presence in the case of the application of an open source system.

2. The financial resources available for the library: It is intended here spending, which may adopt the library to get a new system needed to run it and the size of the devices.

3. The needs and requirements of the library: the library needs vary according to the services that you may wish to make to the beneficiaries and affect the size of the system to be purchased; it has the system contains a set of functions that do not fit the services provided in the library.

4- Type and size of the library: there are a lot of systems that are designed to serve low-volume libraries or a certain type; we find systems aimed at small or school libraries such as Avanthi system or a private academic library such as Koha systems so library should take into account to choose the appropriate system to them [22].

• Second: General parameters of the system [23]:

1. Flexibility: means the extent of flexibility of the system to accept future needs without re-design of the system or impairing the operation and implementation processes.

2- Harmonization: where should the requirements how to thread and overlapping system identifies with another system at the university as well as with automated systems in the library and regulations applicable in other libraries.

3. Easy: where should the system is characterized by ease of use by those working in the library and include instructions to run and do different operations.

4. Seizure control: the system must be able to execute the library's policies and the application of sanctions, fines and send notices to return the books.

5. Stability: It means the stability of the system operation and no errors in it and its compatibility with the hardware and operating systems used in the library.

6- Costs: You may need the system after its application to more costs for maintenance and periodic examination as to the application of open-source system does not mean that there is no cost; but sometimes find themselves the library in front of a financial bind as a result of the need for specialists to develop the system so; prefers taking into account the financial aspect before applying system and study the experiences of other libraries that apply the same system.

• Third, The technical parameters of the system:

- Adherence to standards and standard specifications: It means the standards set by the library system or library

may use standards set by authorized parties such as the evaluation and adoption of software engineering center.

VII. THE PROS AND CONS OF OPEN SOURCE SOFTWARE

• The pros of open source software:

Open source software is characterized by the presence of many of the features that are not available in the closed or trading systems Just remember Robertson examine those features such as [24]:

1. FREE: You can get the system or the software is free and can only pay for expenses for services provided by system suppliers, such as training or maintenance.

2. Ease of Customization: Open source software allows access to the source code of the program, making it easier to customize an exercise program to suit the need of the beneficiary in the case of the availability of programming experience he has.

3. rely on platforms open source or freeware: are building systems using open source platforms and open source tools such as JavaScript, PHP, Perl, which reduces dependence on suppliers of business software and reduces the production costs of the program and creates a rich work environment for developers.

4. Ease of integration: the fact that open source software makes it easy to produce practical tools to integrate the software with new services may appear in the future, without any cost.

5. experiment by the application: the program you see is what you get, the software open source available for download and use for any user of the Computer.

6. Availability of Technical Support: Open source software is characterized by a large community of developers who provide support for the software without any financial compensation.

• The cons of open source software:

On the other hand, there are many defects which are calculated on open source software, including:

1. Free is not absolute: that does not mean that open source software that there would be no cost, where the need to spend on such programs in the application stage show and sometimes for technical support.

2. unguided large enterprises: a lot of open source software be oriented medium-sized enterprises or small and often cannot cope with the needs of large institutions.

3. The level of maturity: lacking most of the open source software sufficient degree of maturity, we find many of the functions are incomplete or do not work well Unlike commercial programs that are prepared with high efficiency.

4. Lack of documentation: We find that many of the open source software code without documenting users to help

deal with the program and this is due to the fact that the process takes a long time by the developers of the software.

The existence of these visions demonstrates that the scenario of free software ventures still needs to be more clearly understood since they are innovative and competitive businesses that can take on more complex shapes than the ones being portrayed [25].

VIII. CONCLUSION, RECOMNDATIONS AND FUTURE PERFORMS

It represents an alternative to open-source software for commercial software may sometimes be the first choice for libraries to avoid paying large sums of money to buy a trading system. However, the selection process involving some of the obstacles highlighted by the lack of clear criteria can be relied upon to choose those systems. In particular, and it is clear to us that some of the advantages of open source software may also be the disadvantages at the same time, such as free of this software, which is an advantage, but it is one of the flaws and the negatives as they are not free absolute.

Current study is to highlight the top 11 open-source software to manage Libraries in addition to standards that may represent the basic building block for the selection of the appropriate systems to the needs of the library digital, by reviewing a series of studies and scientific research related to the subject of the current study, the current study has concluded results as follows:

- The use of open source software in libraries has become a phenomenon that cannot be overlooked, the presence of many software that works to manage all the operations in the libraries have become there A need to know the suitability of these systems for use in libraries.
- Open-source software developments are basically Internet-based communities that voluntarily collaborate in developing software on the Internet and such Internet communities have become an important cultural and economic phenomenon.
- There is a close association between open source software and the library community, both of which represent free culture.
- There are many differences between open source software and commercial software, the differences may affect positively or negatively the institutions or entities that may adopt the use of that kind of software.
- The process of choosing open source software has some obstacles Most notably, there are no clear and reliable criteria for selecting these systems.

In light of the previous outcomes, the current study recommends with the following recommendations: -

- Awareness of the role and importance of open source software and the facilities it provides in managing digital content.
- Holding international conferences to discuss the use of open source software for library automation.
- Develop a set of criteria that may represent the basic building block for identifying and selecting appropriate systems for library needs.
- Providing training courses for specialists to develop the technical skills needed to use open source software to create digital libraries.

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