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OpenBiblio: A Free and Open Source Integrated Library Management System that Answers Small Libraries’ Automation Needs

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ABSTRACT

This paper assesses the suitability of Openbilio as a free and open source integrated library management system that answers small libraries' automation needs considering the fact that many free and open source integrated library management systems exit that require more skills and resources which these libraries do not have. The study was a qualitative technical paper on OpenBiblio. Qualitative data through documents analysis on OpenBiblio was collected and analyzed in light of its strengths and weaknesses. Secondly, the author used his personal experience of working with OpenBiblio to evaluate its suitability for use among small libraries. The findings show that OpenBiblio is suitable for small libraries because it is easy to install and configure as compared to Koha, Evergreen and other integrated library management systems which require immense technical knowledge of Linux, MYSQL, HTML and CSS. Further, it has also been observed that OpenBiblio can run on a small computer with at least 512Mb of RAM and can run on both Windows and Linux. The study also discovered that OpenBiblio has four modules (Cataloguing, Circulation, OPAC, and Patron management that represent the core functions of small libraries; thus it computerizes the main functions of the library. OpenBiblio was also found to comply with main library standards such as Z39.50 and MARC 21. The paper however discovered that OpenBiblio has limited documentation on the Internet that makes it difficult for new beginners to install and configure it.

Keywords: OpenBiblio, Free and open source software, Integrated library management system, Library.

I. Introduction

Many small libraries in developing countries especially in Africa have failed to automate their operations because they could not afford procuring proprietary library management systems. Library automation has been a preserve of wealthier libraries mainly in developed countries that could afford proprietary library management systems. Trajan (2012) observes that many libraries face financial challenges and any little money they do have go to purchasing additional information resources. Libraries that receive some funding are overburdened with operations costs as they spend two-thirds of their budgets on among other things personnel; they often have more demands than resources (Singh and Sana man, 2012). Lack of financial resources is more acute in developing countries where libraries receive less or no funding from their parent organizations. However, the formation of the Open Source Initiative (OSI) in 1998 by Eric Raymond has reversed this scenario because countless open source library management systems such as OpenBiblio, Evergreen, ABCD, CDISIS and Koha have been hatched. The omnipresence of free and open source library management systems has given impetus to automate their operations in order to bring about efficiency and improved service delivery. The birth of free and open source library management systems has come as a blessing to many libraries especially small libraries such as schools that for many years have lamentably failed to procure proprietary library management systems because of prohibitive prices. Free and open source library management systems cost much less than the commercial counterparts hence providing a realistic solution to the already cash-strained libraries (Adela: 2013). Free and open source library management systems have truly strengthened the capacity of many libraries in service provision especially in developing countries. Libraries are today thronged by many open source library management systems and this has thrown smaller libraries into a serious dilemma as regard to decision making on which library management to use. It is difficult for small libraries to choose the shoe size that fit them from many shoes of library management readily available to use freely. Further, small libraries such as schools and public libraries especially in developing countries lack adequately trained library staff; staff with skills to use free and open source integrated library management systems such as Koha, ABCD and Evergreen to automate library operations. Many free and open source library management systems require special skills to install and configure them. In addition, they may require certain computer hardware on which to run. As a result, many small libraries stand aloof from using free and open source library management systems. This paper therefore sought to evaluate OpenBiblio's suitability as software for automating small libraries.

a. Benchmark Questions Used to Evaluate OpenBiblio

The following are research questions used to evaluate OpenBiblio.

1. On what operating systems does an OpenBiblio run?
2. What are the installation requirements of OpenBiblio?
3. How is it is to install and configure OpenBiblio?
4. What is the data storage capacity of OpenBiblio database system?
5. How many modules are available in OpenBiblio?
6. Doe OpenBiblio adhere to the main library Standards and Protocols?
7. How often OpenBiblio new versions released?
8. How easy it is to get technical support on OpenBiblio online when one runs into difficulties?
9. Is there enough documentation on OpenBiblio on the Internet?

II. Literature Review

Free and open source software (FOSS) is software which is publicly available for use with no cost and its source code (how the software was actually written) is available for others to modify (Jeffrey (2009). This implies, the user can access and use the software without paying for it. In addition, users can modify it to suit their needs. According to Kyle (2014), Stallman described free software as having four characteristics (freedoms); namely:

- The freedom to run the program for any purpose,
- The freedom to study how the program works and adapt it to your needs,
- The freedom to distribute copies so you can help your neighbor and
- The freedom to improve the program and release your improvements to the public so that the whole community benefits. Examples of Free and Open Source Software include Ubuntu/Linux (Operating Software), Mozilla Fire Fox, Apache Server, ABCD, Koha and OpenBiblio.

According to Wikipedia (2015), an integrated library management system is an enterprise resource planning system for the library used for tracking items owned, orders made, bills paid and patrons who have borrowed. It. is basically a system with modules that represent functions of a library. Among the modules include cataloging, circulation, serial management, and catalogue (OPAC) and management reports. In this regard, free and open source library management system implies a library system that is free available to use and its source code is also publicly available. Free and open source library management systems include ABCD, OpenBiblio, Koha, and Evergreen.

a. History of Free Open Source Software (FOSS)

The idea of using, sharing and modifying a software can be traced back to the year 1911 when Henry Ford in the United States developed his own car engine which he allowed other people and companies to use and modify freely. This revolutionalised the automobile industry as many cars with different engines emerged. However, the idea of developing free computer software did not materialize until early 1980s when Richard Stall; who was a research at Massachusetts Institute of Technology (MIT) Computer Laboratory began a project called GNU and Free Software Foundation. According to Jeffrey (2009, p.4), Stallman grew skeptical of the commercial software packages that were selling for big bucks at computer stores. He advocated for the introduction of free software whose source codes could be copied or hacked by computer programmers and users to modify in order to improve performance. Richard wanted to promote the concept of free software. However, the concept of free software did not go well with Software business companies that questioned the morality behind such a concept; wondering why any product or software could be release without participating in the market for returns. This painted free software as being unreliable. This prompted Eric S. Raymond and others in consultation with Richard Stall to develop the term open source as a more business friendly term than free software. Open Source had a more inclusive meaning, in that licenses that were not as strict about the need to pass on modifications would also qualify to be launched under the Open Source Initiative. By 2007, Commercial Open Source Software had effectively co-opted this term, leading the community to coalesce around the term Free Open Source Software (FOSS) to bring the original visions of Stallman and Raymond back together. Others called free software as Free-Libre Open Source Software (FLOSS).

Today Free Open Source Software are released under many Open License Models which include the following; GNU General Public License ("GPL"), GNU Lesser General Public License ("LGPL"), BSD, MIT, Apache, Mozilla, IBM, and Apple, Sun. There also foundations that have been set to support the concept of Free-Libre Open Source Software which include Free Software Foundation (FSF) started by Richard Stall (Arkhtar:2013).

b. Free and Open Source Integrated Library Management Systems

The use of free and open source software has spread to many sectors which libraries. Many free and open source library management systems have been released that help to automate the house keeping activities of libraries.

These library management systems include Koha, Evergreen, Invenio, ABCD, Kuali OLE, NewGenLib, PhpMyBibli, OpenBiblio, OpenILIS, WEBLIS, Emilda, and Firefly (Wikipedia:2015; Arkhtar:2013)

As already alluded to, OpenBiblio is a Free Open Source Software available for library automation. It was created in 2002 by Dave Stevens (Wikipedia: 2015). OpenBiblio is currently being maintained by Hans van der Weij. This library management system is written in Preprocessor Hypertext Language (PHP). Dave Stevens thought of coming up with an easy-to-use, well-documented, easy-to-install library system. Like any other software, OpenBiblio has evolved and its latest release is version 0.7.2, released in August, 2014 which is recommended for new installations and for updating older versions. It contains OPAC, circulation, cataloging, and patron management modules. The software has been translated into many languages which include English, French, Spanish and Russian.

c. Adoption and Use of OpenBiblio

Wikipedia (2015) observes that OpenBiblio is popular among small libraries and archives worldwide. OpenBiblio has been and still being implemented by small libraries in many countries. Although statistics on the actual number of libraries using OpenBiblio is difficult to come by, libraries in different countries are using OpenBiblio. Its adoption and use is wide spread especially in South American school libraries. Small libraries in countries such as Colombia, Cuba and Venezuela, and Chile are using OpenBiblio. Further, some small libraries in countries such as the United States of America, Canada, Armenia, and Tanzania are using the software. The Download of OpenBiblio captured by Sourceforge, (the website where OpenBiblio software files are hosted) from 8th -14th January, 2014 can help you to understand how widely OpenBiblio is being used in libraries.

TABLE I
DOWNLOADS OF OPENBIBLIO BY COUNTRY FROM
8TH TO 14TH JANUARY, 2014

Country	Number of downloads per country (from 8th to 14th January, 2014)
Algeria	1
Anonymous Proxy	2
Argentina	1
Armenia	1
Australia	2
Bangladesh	1
Belgium	9
Bosnia and Herzegovina	4
Brazil	16
Cambodia	4
Canada	5
Chile	2
China	2
Colombia	1
Cyprus	2
Denmark	1
Ecuador	2
Ethiopia	1
Finland	1
France	4
Georgia	2
Germany	5
Ghana	3
Greece	7
Hong Kong	3
India	33
Indonesia	13
Iraq	1
Italy	14
Jordan	1
Kenya	7
Korea	1
Libya	1
Lithuania	2
Mauritius	7
Mexico	19
Mongolia	4
Morocco	2
Namibia	2
Nepal	2
Netherlands	5
Nigeria	4
Peru	2
Philippines	5
Poland	4
Portugal	1
Qatar	1
Romania	6
Seychelles	15
Singapore	1
South Africa	4
Spain	7
Taiwan	3
Tanzania	1
Thailand	14
Uganda	1
United Kingdom	5
United States	21
Uruguay	1
Yemen	1
Total	293

The download statistics given in Table 1 clearly show that OpenBiblio is widely being used by many small libraries to automate their operations.

d. Features of a Good, Free and Open Source Library Management System

There are several features that a good, free and open source library management system should posses. These include:

Basic hardware and operating systems requirements- Any software (Open or Closed) is installed and booted on the computer hard disk and use resources from the RAM. According to Sarojanand (2013), before selecting software to use either FOSS or proprietary software, there is need to carefully look at the basic hardware requirements. Some software would require large amount Hard disk and RAM for them to be installed. In this regard, a good free and open source library management system should run on a machine with minimal amount of hard disk and RAM. Further, it should run on several operating systems such as Windows, Linux and Macintosh operating systems.

Reliability and maturity of software-Experience has shown that software that has been in existence for long are stable and mature. Like a child moves from childhood to adulthood, software too pass through these maturation stages. As they move from one stage to another, they get polished and refined. “Early versions of a software often offer relatively few features and can be filled with defects” (Tristan, 2011, p: 5). It can therefore be said that mature software will perform better that newly introduced software. This presupposes that a library should adopt software that is mature enough; software that has been in existence for a longer period of time.

Conformity to existing international standards-In Library and Information Science field, standards on how to physically describe information resources and importing and exporting bibliographic data have emerged. These include MARC 21, CCF, AACR3, RDA, LCSH and data export/import in ISO 2709 (MARC/CCF). These standards have been accepted as international standards. According to Sangeeta (2010), a good library management system should support internationally known standards so that library staff could have the latitude to exchange bibliographic data with other libraries around the globe. Further, a good library management system should comply with UNICODE which is mostly using data encoding system for assigning numbers to all characters for the computer to understand. This will allow interoperability; allowing data to be exchanged between different computers platforms.

Integrated system-One of the features of a good library management system is that it should be an integrated system; meaning that it should have all the modules that represent the all the housekeeping functions of the library such as cataloguing, circulation, OPAC, serials, and reports. As Balassubramanian (2011, p: 38) observes, current library management systems are integrated systems, based on relational database architecture. All the library housekeeping operations of a library are contained in one database.

Customization and Expandability (Scalability)-The system should permit addition of new feature to meet the local need and use. Scalability is the ability of a computer application or product (hardware or software) to continue to function well when it (or its context) is changed in size or volume in order to meet a user need. Typically, the rescaling is to a larger size or volume. Software should be expandable; ability to be upgradable to new versions (Arkhtar: 2013). A good library management system should allow the plug-ins and further give the adopting library the latitude to customize it so that graphical user interface mirrors local requirements of the library.

User friendliness-Many librarians and computer system experts are in agreement that good software should not be difficult to use by both the library staff and users. It should be user friendly (Sangeeta, 2010).The software should be built on graphical user interface (GUI) environment. It should provide expert advice and assistance in performing any task. It should empower the experienced user with short cut and inexperienced user with menu driven icon, dialogue box, etc. giving clickable access to the software. The software that is built on other platform should have the mnemonic based command.

Capacity of the Software-It is the desire of any librarian to adopt a library system that is robust enough to allow all the bibliographic records of the libraries stored in there. However, some systems have restrictions in the amount data to be stored in them. A good free and open source library management should be robust enough to allow the library captures and stores its entire library collection on the system database.

Documentation-Documentation is one of the most important components of an application development. Even if a program is developed following the best programming practices, it will be rendered useless if the end user is not able to fully utilize the functionality of the application (ITL Education Solutions Limited, 2011). A well-documented application is also useful for other programmers because even in the absence of the author, they can understand it. Some software barely have documentation; thus; making it difficult for the users to use it. For open source software, documentation is not only important to users but also to software developers who may wish to contribute to the development of software.

Software user community and active Community of developers-Good software should have many users. Further, the user community should be active by collaborating and networking with each through platforms such as wikis and blogs. If the user community is large and active, software user with problems can easily find solutions from other user. Active user community makes the software sustainable. As Tristan (2011) observes, some free and open source library management have inactive user communities thereby making it difficult to attract new users.

Further, a good free and open source library management system should have an active community of developers. It is well known fact that FOSS does not have full-time developers who are paid by an organisation. These developers are volunteers who need to be collaborate with other developers to ensure that software patches and new versions are developed and released. This makes the software sustainable. In addition, FOSS with active community of developers (experts) makes it easy and faster for software users to get technical support when they need it.

e. Research Design and Methodology

This research was a qualitative technical paper. Qualitative data through documents analysis on OpenBiblio was collected and evaluated in light of the prescribed criteria or yardsticks of a good free and open source library management system to determine the suitability of OpenBiblio as a system that small libraries can use to automate their operations. Secondly, the author of this paper used his many years of experience of working and teaching OpenBiblio to Library and Information Science students to evaluate its suitability.

III. Findings

a. *Basic Hardware and Software Requirements of OpenBiblio*

OpenBiblio is a simple library management system that can run on a machine with basic computer hardware and software requirements as shown below.

TABLE II
BASIC HARDWARE AND SOFTWARE REQUIREMENTS OF OPENBIBLIO

Hardware and software requirements	Minimum recommended
RAM	1GB
Hard disk space	40 GB
Server	Apache 2.2.14
Database management system	MySQL 5.1.41
Scripting language	PHP 5.3.1

As seen above, OpenBiblio is a server based library management system. Therefore, it runs on a server called Apache and powered by MySQL database management system. It further needs PHP scripting language as it is written in PHP.

b. *Installation of OpenBiblio*

As alluded to, OpenBiblio runs on Server; therefore one needs to install a server Apache and other server complimentary software in this case, MySQL and PHP before installing OpenBiblio. The installation of this software has been simplified by the birth of Xampp and Wamp. Xampp or Wamp contain Apache, MySQL and PHP. This entails that by installing Xampp or Wamp all the three software will be installed. Note that Xampp and Wamp are also FOSS.

Once, Apache, MySQL and PHP have been installed, an empty database called OpenBiblio needs to be created and access privileges defined in MySQL. This will therefore require some basic skills of structured query language (SQL).

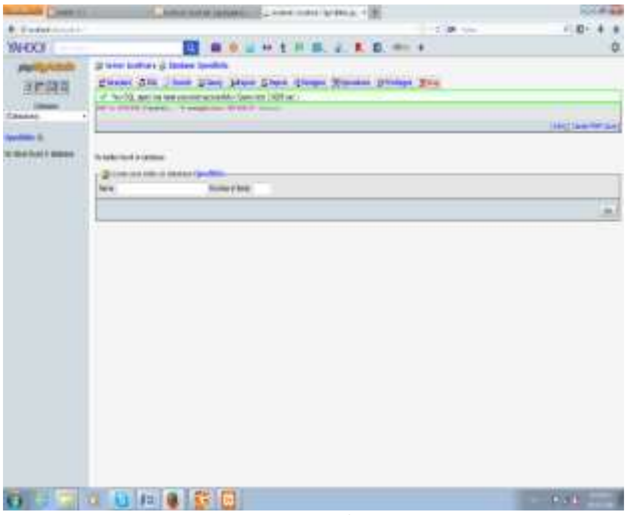


Fig. 1. Installation of OpenBiblio

c. *Modules and Features of OpenBiblio*

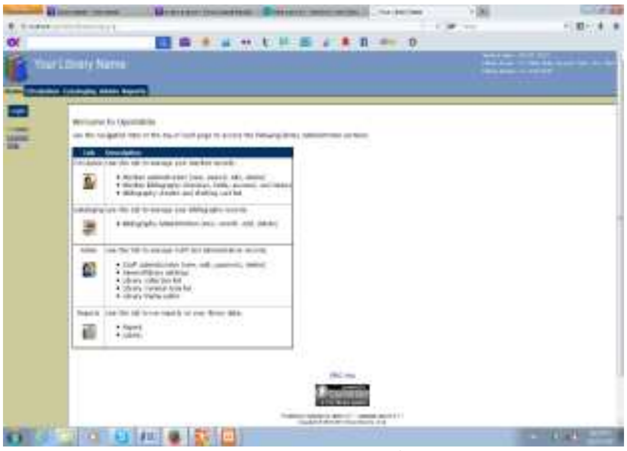
Like any integrated library management system, OpenBiblio has five main modules. These are:

TABLE III
MODULES PRESENT IN OPENBIBLIO

Name of Module	Present
Cataloguing	Yes
Circulation	Yes
Patron management	Yes
Serial Management	No
Acquisition	No
Web OPAC	Yes
Reports management	Yes

d. *Customization and Use*

OpenBiblio is among the easy to customize and use library management systems I have worked with. The founder's principle was to develop a simple to install and use library management system. This has indeed turned out to be the case. OpenBilio has the Administration icon where the system administrator logs in to customize the system; by editing the name of the library, setting up user accounts, etc. Further, using OpenBiblio is easy as functions such as cataloguing, circulation and reports generations can be done with easy. Unlike in Koha and other library management systems where reports generation requires knowledge on how to write a query in SQL, OpenBiblio has made it easy for library staff to generate queries on stock circulation, users, etc and are displayed in Portable Document Format (PDF). In addition, barcodes for the catalogued materials are easily generated and can be printed from a barcode printer.



Your Library Name

Fig. 2. Customization and use of OpenBiblio

e. *Conformity to Existing International Standards*

OpenBiblio complies with UNICODE; the internationally accepted standard for data coding. Therefore, it supports interoperability. It can run on different computer platforms that use UNICODE. More importantly, OpenBiblio supports the main library standards for information description such as MARC 21 and Z39.50. Library staff therefore can download bibliographic data from other library databases and upload the on the cataloguing module of OpenBiblio.

However, library staff can not directly (through the internet) import bibliographic data from other libraries. He/she has to download data to the local machine disk and later upload it onto OpenBiblio.

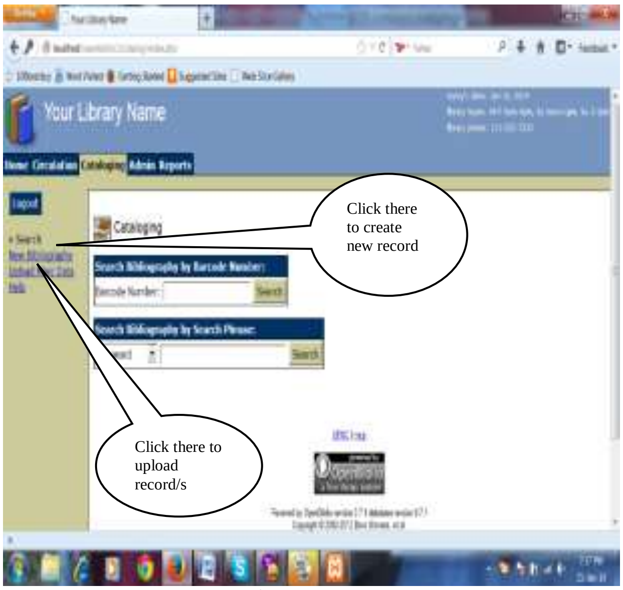

Your Library Name
Home
Circulation
Cataloging
Admin
Reports
Logout
Cataloging
Search Bibliography by Barcode Number:
Barcode Number:
Search
Search Bibliography by Search Phrase:
Search
Click there to create new record
Click there to upload record/s

Fig. 3. Creation of records options in OpenBiblio

f. Reliability and Maturity of OpenBiblio

OpenBiblio has been in existence since 2002. Document analysis has revealed that it had eight versions released. OpenBiblio has been in existence for 13 years now. Many of the have been rectified. In working with OpenBiblio, I have discovered that its failure rates are minimal. Only once I have failed to retrieve my library because of bags or system errors. However, one can still recover the OpenBiblio database; where library information is stored and can run it on another installed OpenBiblio.

g. Capacity of the OpenBiblio

The initial versions of OpenBiblio were allowing libraries to enter up to 25,000 bibliographic records. The latest version which is 0.7.2, can take more than 50, 000 records. This entails that the software has been scaled up to accommodate libraries with large collections. The capacity of OpenBiblio could be said to be sufficient or enough for small libraries as they do not have large collections.

h. Community of Users and Developers

Unlike other free and open source library management systems, OpenBiblio does not currently have a critical mass of developers, contributors and users. For example, the responsibility of developing the software still squarely rests on the shoulders of the founder (Dave Stevens) and now on Hans van der Weij. Many software developers seem not have joined Dave Stevens to propel the software to greater heights in the same way they doing for KOHA and Evergreen. Failure for OpenBiblio to attract many volunteer developers has made the software not be regularly updated. It takes more than a year to have serious updates or new version of software released. In addition, OpenBiblio' users are not active as the OpenBiblio Forums and blogs are not active. This makes it difficult for users to help each other in case some users are experiencing some difficulties in the use of the software.

IV. Discussion of the Research Findings

From the above presented findings, it is clear that OpenBiblio has a number strengths and weaknesses that any adopting library should be aware of. One of the strength of OpenBiblio as revealed by the research is that it does not run only on sophisticated hardware but it can be installed and run even on a personal computer with RAM 1GB. This is a good attribute which makes it suitable for small libraries that cannot afford buying expensive computers hardware such as servers. Further, OpenBiblio 0.7.2 runs on the three operating systems (Windows, Mac and Linux). Unlike other free and open source library management systems such as Koha that only run on Linux, OpenBiblio runs also on windows platform which many users are used to. The installation and customization of OpenBiblio especially on Windows based operating systems is user friendly. The fact that all the platform software such as Apache, MySQL and PHP has been put in the software called Xampp simplifies the installation of Openbiblio as you need only to install Xampp and all the infrastructure software for OpenBiblio are installed. Furthermore, OpenBibio has a user interface and simple navigation buttons or icons which make it easy for system administrator with little knowledge of ICTs to customize the systems with or without the manual. The customization of OpenBlio can be finished in a matter of minutes. So far, no library management system has been built with such simplicity. Library systems like Koha, requires several days for one to properly customize them and the customization has to be done with reference to the manual. The fact the OpenBilio has been build on the principle of easy installation and use makes it better that robust systems which is user-friendly, therefore small libraries with staff who are semi-ICT skilled should ponder adopting it.

As revealed in the literature, a good FOSS for library management system should support internationally known standards so that library staff could have the latitude to exchange bibliographic data with other libraries around the globe (Sangeeta, 2010). This study has revealed that OpenBiblio is built on the ISO 2709 to conform to main library standards on information interchange. It supports standards such as MARC 21; making it possible for a library to import bibliographic data from other libraries. In addition, OpenBiblio has come of age as it has been in existence for more than 13 years; therefore it is mature software. According to (Tristan, 2011, p: 5), early versions of a software often offer relatively few features and can be filled with defects". It can therefore be said that main failures and problems of the software have been detected and solved by now. Therefore, users of the software expect minimal level of failure.

Like any other, integrated library management system, OpenBiblio possesses modules that correspond to the main functions and activities of a library. These include cataloguing, circulation, reports, Web OPAC and patron management. The presence of these five modules makes OpenBiblio to a good choice for small libraries that do not require the serial module. Small libraries rarely subscribe to serials (journals etc). The absence of the serial module does not affect their operations.

Despite OpenBiblio scoring well on most of the benchmarks of a good FOSS, it has failed on other important parameters. For instance, OpenBiblio lacks an active community of both developers and users. Tristan (2011) and other scholars refer to OpenBiblio as being an inactive software as they have not noted any development in the source codes of the software for many years. This is true in the sense that between 2008 and 2012, no development activity of the source code of OpenBiblio took place. In addition, OpenBiblio's forum, wikis and other user forums of OpenBiblio are inactive. Users are not collaborating and networking. A research conducted on OpenBiblio' forum at http://sourceforge.net/p/obiblio/discussion/164978/ for the period between 1st January to 15, 14, revealed that only two users have posted some help requests on the forum. These are signs of dying software. These are strong indicators pointing to the uncertainty about the future of the software. It might die any time and leave libraries using it as orphans.

Further, as (ITL Education Solutions Limited: 2011) observed that a good FOSS should have good and detailed documentation so that both the developer and the users should follow. This research has shown that OpenBiblio does not have real documentation on its official website and other sister websites. This makes it difficult for the user to install and customize the library system. My experience when it comes to finding documentation especially on how to customize OpenBiblio has been horrible. I have on several occasions failed to find information on how to customize for instance the OPAC. This also subtracts greatly from the virtues of OpenBiblio.

V. Conclusion

It is clear from the research that OpenBiblio is suitable for use in small libraries such as schools because it is easy to install, customize and use. The software runs on basic hardware and it is also available for installation on all the major operating systems. OpenBiblio has major modules needed need by small libraries such as school libraries. However, the main fear is its sustainability; its future is not certain as exhibited by having inactive community of developers and users. The software can soon or later die a natural death if the founder dies as he seems to be the sole developer of the software. Bearing this in mind, small libraries can adopt it but should not close their eyes to other emerging easy to use free and open source library management systems such as BBM that are promising to be crowd pullers. The fact that supports ISO 2709 library standards such as MARC 21 makes it possible for the adopting libraries to migrate to active software once it dies.

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