



# Feasibility of adaptation of open source ILS for libraries in Kenya: a practical evaluation

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## Abstract

**Purpose** – Despite its fast growth and penetration in all sectors, it has been noted that open source software (OSS) is yet to find its optimal place in libraries, particularly libraries in the developing countries. Lack of documented information on the experiences and use of open source integrated library system (ILS) is a major drawback, and so the need for this study. The proposed study aims to help to investigate and test usability and cost effectiveness of a typical OSS for ILS. It will involve deploying the software from installation, configuration to creating customized user interfaces and structures that are specific to the requirements of the library's parent organization. The cost and performance of the OSS will then be compared with that of a typical commercial based software with the same functionalities.

**Design/methodology/approach** – A preliminary study has been conducted to collect data from libraries in the country through distribution of questionnaires to provide data for accurate analysis that will form the basis for recommendations. The target group includes library and IT personnel in the various institutions and the end-users within sample group. A case study is proposed to help establish OSS effectiveness in libraries. To test a typical OSS, parameters are to be drawn from two models – open source maturity model and business readiness rating.

**Findings** – A casual observation of the Kenyan situation reveals that the majority of academic, public and research libraries depend on commercial, free or locally developed systems. This scenario may be attributed to lack of knowledge (or interest) in OSS alternatives and lack of sufficient technical expertise to support them. While there are quite a number of libraries and librarians worldwide that have shown a great interest in OSS, few library administrators have actually implemented OSS. Could this be due to fear of taking on the risks that may come with reliance on open source library automation systems? Is the low uptake due to lack of sufficient technical expertise in the libraries? The research outcomes will help formulate a model and guidelines to be used by systems librarians considering the use of OSS for library processes. Factors to be considered when deciding on OSS will be outlined.

**Research limitations/implications** – This paper is of importance to library personnel in Kenya as it establishes the effectiveness of OSS, with the aim of empowering the library staff who have for a long time relied on their IT departments and vendors for systems installation and implementation.

**Originality/value** – The study will result in a comprehensive evaluation of the economic and functional advantages of OSS as an alternative for the library in Kenya. Librarians involved in selection of software for their libraries will find this helpful when deciding on the type of software to select for their libraries. It will help to enlighten library professional about the value of OSS and how they can participate in the development of their own systems, instead of always relying on vendors.

**Keywords** Research, Libraries, Information systems, Integrated software, Library automation, Library systems, Open systems, Kenya

**Paper type** Research paper



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## Introduction

As open source technology continues to gain status, more organizations are migrating from proprietary to open source software (OSS). The open source movement has made an impact worldwide, with over 10,000 open source projects developed for different development sectors. High performance systems for health, education, economic and various information service sectors have been developed, thus increasing options available for systems implementation. Libraries should find a natural solution in OSS which shares the same principles for service – “openness”. Libraries, like the open source movement are formed on the basis of fair, free and open provision of service to all.

The OSS movement started over 20 years ago and has been fast gaining momentum worldwide (Hogge, 2006). Many researchers have compared open and closed source software and argued out their findings in various conferences, research papers and articles (Raghunathan *et al.*, 2005). The distribution of natural intelligence does not correspond to the monopolization of innovation by the richest firms or richest countries. Open source has drawn interest from all quarters in the developed and developing world and discussion groups are actively engaged in debates and finding innovative ways of implementing OSS. Open-source development has led to the creation of applications such as the Linux operating system and the Apache Web server (Tennant, 2000) – indeed, Linux-based operating systems have captured nearly 30 per cent of the server market. Singh and Sanaman (2012) add that open source has evoked great interest that has resulted in a vast volume of research in the last few years and is now in the mainstream software market. One study show that an OSS server which can be a normal computer can serve 30-40 other desk top computers and be able to facilitate e-mail, internet and e-fax alongside normal operations at higher security levels and at 40 per cent the cost of proprietary software (Netcraft Web Server Survey, 2001). The full impact of OSS is now felt across all operative sectors of economy and social spheres. It encourages innovation and is said to be easier and quicker to learn and so can be easily adapted to businesses processes in public and private sectors (Strathmore University, 2009).

While there are great debates on the topic, there is a great deal of evidence that mature open source applications offer a lower total cost of ownership than their commercial counterparts (Surman and Diceman, 2004). Other unique attributes of OSS include zero costs of acquisition, ability to use for whatever purpose, ability to adapt to meet local requirements, and ability to distribute changes. Some of the key reasons for OSS low cost are given in Wheeler’s (2007b) article “Why Open Source Software/Free Software (OSS/FS)? Look at the Numbers!” They include:

- No license fees.
- Upgrade and maintenance costs are far less due to improved stability and security.
- OSS can often use older hardware more efficiently than proprietary systems, yielding smaller hardware costs and sometimes eliminating the need for new hardware.

Undoubtedly, with the above merits, OSS should provide a cost effective automation solution to libraries in every part of the country regardless of location, size and most importantly, budgetary allocation. OSS promises backup from experts and its

proponents. In case of bugs and viruses, a wider group of experts have the chance of troubleshooting and providing solutions which are highly refined due to the high level of participation and openness (Ruffin and Ebert, 2004). Therefore, security and durability of OSS is guaranteed where demand for the software is high. Boulanger (2005) observed that the open source model leads to better quality assurance, more frequent releases, involvement of community in development, and the ability for customers to try before they buy.

However, one should note that all of the other cost components involved with software application, such as personnel costs for system administration, applications maintenance, and facilities management, all apply also to OSS. As with anything else, there are advantages and disadvantages of OSS (Cervone, 2003; Boss, 2005), but in spite of limitations and drawbacks, an increasing interest in OSS is observed due to its lower overall cost. Singh and Sanaman (2012) advance the OSS case by stating that if OSS helps the library to serve its users at a lower cost than proprietary software, then it is in their interest to adopt it.

African countries have been actively involved in the pursuit to implement OSS as a way of cutting down costs and developing user-friendly programs customized for specific outcomes (Reijswoud and Topi, 2003). Since 2002, working groups and fora have embarked on advocating for the implementation of OSS as an economic and viable alternative to the commercial systems in various African countries. South Africa currently leads in the uptake of OSS and the government there released a policy framework document in September, 2002 to provide the foundation for OSS adoption. In Kenya, many firms now have networks that run on Linux – an OSS. They are embracing this software for daily routine functions and processes, i.e. e-mail, word processing and database management. The usage rate is however low in Kenya with the majority of the OSS implementations being on the server side. Even ten years ago this was being attributed to a poor computing tradition in Africa as a whole (Bruggink, 2003).

At a workshop held in Kenya in 2009 on free and open source software (FOSS) and its uptake for small business development, the country's Vision 2030 which stipulates that 50 per cent of software in government systems should be locally developed was cited as a point of justification for an improved implementation of OSS for software development in the country. The workshop was organized by *ict@innovation* which encourages the growth of African ICT industries and has been spreading FOSS business models for enterprises in East and Southern Africa and supporting innovative local FOSS applications for social and economic development. Participants agreed that OSS would be good for Kenya since it would contribute towards software development in Kenya (Strathmore University, 2009). While OSS has flourished for a number of years for infrastructure-level components, it has not gained a stronghold in the library automation arena in Africa (Morgan, 2002). The overwhelming majority of library automaton software is offered through commercial companies as propriety, closed-source software.

In the last few years some viable open source integrated library systems (ILSs) have emerged where libraries joined the OSS initiatives much later. Libraries in Kenya have likewise, not yet fully plunged into the open source wave. This is despite the numerous projects and campaigns bolstered by workshops and the influx of open source based packages in the market. Initiatives have been started in other countries to develop

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systems for library use in all levels of operation. Software has been developed for digitization of documents or creation of digital libraries. Others include ILSs with modules to support cataloguing, serials control, purchase and order of library items, circulation and online public access catalogs.

Some of the listed open source ILS include ABCD, BiblioteQ, e-library, Evergreen, Koha, MiniSOPULI, NewGenLib, Next-L Enju, OPALS, Open Library Environment (OLE), Open Biblio, OtomiGenX, phpMyLibrary, PMB, and SENAYAN amongst others. Apart from these, there are OSS specifically developed for archival record management, referencing, content management, digitization, journal publishing, image displaying, interlibrary loaning, preservation and reserving. (FOSS4LIB, n.d.; Boss, 2005).

The benefits of OSS to libraries have been cited in various literature. Mutula (2007) asserted that OSS will give librarians, especially those in Africa, the opportunity to venture into application development in partnership with counterparts and other professionals around the world. OSS provides opportunity for the IT experts in libraries in the continent to take part in software development, an area that requires improvement. Few African specialists are involved in the development of ICTs, a scenario that could easily be changed with the adoption of OSS in all sectors, including the library. Software engineering in Africa can greatly benefit from the expertise that is made available by the OS community – already noted ten years ago by Reijswoud and Topi (2003). Morgan (2002) further added that OSS presents an opportunity for librarians to take control of library services and collections that rely on computer software.

Libraries are generally poorly funded. If OSS costs much less than the commercial counterparts, then it provides a realistic solution to the already cash-strained library. Libraries in many organizations spend some two-thirds of their budget on personnel and they often have more demands than resources (Singh and Sanaman, 2012). The little that is left is allocated to collection building and purchase or upgrade of library systems.

In the last few years some viable open source ILSs have emerged and “open source ILS movement has progressed past the point where its viability can seriously be questioned” (Breeding, 2009). In fact, though the scenario in Kenya libraries is sluggish and that the libraries in Kenya, unlike other sectors are yet to fully plunge into the open source wave for ILS there have been some impetus or interest created for the Kenyan libraries over the last two years. Libraries in Kenya, like those in other countries, have automated or are migrating from manual to computerized systems to match current technological trends and to be at par with libraries in the region and worldwide.

More emphasis has recently been placed on digitization of library collections in Kenyan libraries and archives. Most have opted to set up institutional repositories and digital collections using OSS like Greenstone and DSpace for varying reasons that include the low cost and the high level of awareness created by the proponents of the various digitization OSS. For example, the EIFL which is an international not-for-profit organization has been working with libraries in developing and transition countries, including Kenya to enable access to digital information. Its FOSS initiative has established the African Digital Libraries Support Network project which has resulted in a centre at the University of Nairobi whose objective is to promote the use of Greenstone in Kenya – for creation and improved access of African local content. A

workshop in February 2010 brought together librarians from over 20 academic and research institutions and has resulted in the creation of institutional repositories in almost all the participating institutions (EIFL, 2010).

For integrated library processes worldwide, several libraries have opted for free software or systems developed by their own staff due to their low budgets, high cost of commercial ILS and/or need to implement up to date systems in order to conform and collaborate with other libraries. Libraries are now opting to take care of the IT side of library processes themselves as opposed to depending wholly on their IT departments. Support and basic maintenance of systems are therefore routinely performed by staff within the library. The library in Kenya today generally has high level technical expertise or ICT literate staff that are able to troubleshoot and manage IT based systems and ensure that they correspond with current library standards.

Libraries have traditionally been the place to go for free information. Like libraries, OSS can be “borrowed” for free (Muir, 2005). The “freeness” in OSS makes it appealing to the library which shares in the spirit of free service. This software can be obtained freely then modified by writing different versions of the information and redistributing in new forms and formats. For libraries that may not have adequate technical ICT expertise, the necessary support is available from vendors who have modified and repackaged the OSS for commercial purposes, from the original developers and community support via e-mail lists and internet relay chat (IRC) channels (Breeding, 2007). Even with vendor support, the total cost may not necessarily surpass that of the commercial software. Singh and Sanaman (2012) observe that more library administrators have discovered that there are notable advantages to using OSS today since “open source library application software products are rivaling and even surpassing their proprietary counterparts in terms of functionality and quality.”

The benefits of OSS relative to proprietary software have been extensively discussed and ways of quantifying the total costs of the development have been developed. There have been tested and untested arguments for and against OSS (Boss, 2005; DiBona *et al.*, 1999). Nevertheless, empirical data on the impact of OSS, concerning its use and development is still quite limited – particularly in the developing countries.

The proposed sample group in the present study, comprising of academic, research, public and special libraries in Kenya, will provide initial data that will help establish current trends in the implementation of ILS in Kenya. A case study of two systems – one open, the other closed will be concluded using evaluation models with quantifiable parameters. This will form the basis for formulating standard specifications for those who may want to implement OSS in their libraries. The outcome is hoped will give credence to open source library systems and validate OSS applicability in the libraries in Kenya and other developing countries.

### **Assumptions and justification for the study**

Many libraries operate on low budgets and thus open source is a welcome solution. OSS has been implemented in libraries that wish to cut down on costs and offer custom made interfaces and modules for their users’ satisfaction and specific library requirements.

Open source is peer-reviewed. It is exposed to extreme scrutiny, with problems being found and fixed instead of being kept secret until the wrong person discovers

them. This peer-review process results in a code base that is more reliable than closed, proprietary software. Support of the software can be sourced from within the libraries or externally from vendors who support the specific open source systems (Cervone, 2003).

Therefore, implementation of open source in libraries in Kenya should not be seen as an impossible task. Librarians have for a long time depended on commercial vendors who do not offer products that are specific to the needs of those libraries. Many libraries have ILS that are not commensurate with the needs or actual usage. There are quite a number of libraries that have invested heavily in expensive software just to perform limited operations. Underutilization of ILS is common in most libraries in Kenya. So, why invest so much money only to make use of less than half the equivalent of that amount?

It makes sense when following the ethos of the open access in the library, to simultaneously endorse an open source movement. Both have similar objectives with open source concentrating, as the name suggests, on access to the source code for software. In an interview with Adobe executive, John Loiacono, following the decision not to adapt open source in its creative suite portfolio, Loiacono stated that "Open-source software can be a perfect solution. It is just not right for everything or for everyone" (Shankland, 2007). OSS may be good, but without proper evaluation and matching with specific needs, it is impossible to rate and recommend specific systems. Lack of documentation on the experiences with most of the OSS has exacerbated the situation.

The proposed study will help to investigate and test usability and cost effectiveness of a typical OS library software in a library. This will involve deploying the software from installation, configuration to creating customized user interfaces and structures that are specific to the requirements of the library's parent organization.

Koha, an open source ILS that has been in use in various libraries for the last 11 years will be used in the case study. Koha has been selected because it is a full-featured open-source ILS that has a wide support and user community and has a good following in Kenya. Koha was initially developed in New Zealand by Katipo Communications Ltd Koha was first deployed in Horowhenua Library Trust and has continued to be upgraded from Version 2.2 upwards by a team of software developers from around the world (Koha Library Software Community, 2012; Boss, 2005).

The comparative analysis of Koha and NewGenLib by Singh and Sanaman (2012) conclude that though both software packages are more or less equally important in different aspects, Koha is found to have more specific characteristics of open source ILS. They conclude that it is up to the librarian to select the most suitable software on the basis of the library's requirements to automate.

### **Research questions and methodology**

The preliminary research was based upon the following two research questions, with a view of collecting as much data as possible from the public, private, academic, special and research libraries found in Kenya:

- RQ1.* What types of ILS have libraries installed in Kenya? What factors determine librarians' selection of ILS in their libraries in Kenya?
- RQ2.* What is the potential of open source in libraries in Kenya?



The population for this study is over 200 libraries found in Kenya (KENET, 2011). The types of libraries include:

- *Public libraries and archival institutions.* Kenya National Library services has libraries in various towns of Kenya. These libraries are open to the public. The Kenya National Archives and Documentation Centre and Macmillan memorial library are also open to the public. There are also several other private libraries like the British Council Library.
- *National research institutions.* Some of the most current research findings are found in research libraries. Examples are Kenya Agricultural Research Institute (KARI), Kenya Forestry Research Institute (KEFRI), Kenya Industrial Research and Development Institute (KIRDI), World Agroforestry Centre (ICRAF) and International Livestock Research Institute (ILRI).
- *Universities.* The over 20 universities in Kenya have libraries containing information to support the high level of research work done by students and lecturers.
- *Middle level colleges, polytechnics and institutes of technology.* It is a requirement, before accreditation is granted that this category of educational institutions have a well stocked library that will support teaching and learning.
- *Primary schools and secondary schools.* Libraries in schools are still small, with many of the libraries restricting their collection to textbooks only. However, there has been some positive changes in some of the schools in the cities with enough lobbying from librarians who are advocating for their development and upgrading. Examples of schools with modern libraries are Makini, St Mary's and Riara schools in Nairobi.

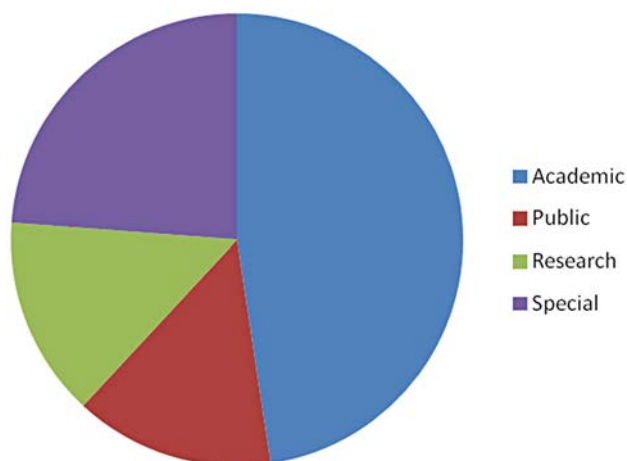
The largest category of libraries in Kenya, in number and size is drawn from the education sector, with university libraries having the largest information collection and users overall. The national body that brings library professionals together is the Kenya Association of Library and Information Professionals (KLA), formerly Kenya Library Association which was registered in 1973 (KLA, 2011).

For the preliminary study, questionnaires were sent to members of the KLA drawn from 49 libraries in Kenya (Appendix 1). These comprised academic, public, special and private libraries. The sample group was first clustered into the different types of libraries then selected randomly (Figure 1).

The questionnaire was used to gather primary data (Appendix 2). An online survey was formulated using the Google survey tool and questions were directed at the various libraries to establish status quo in regard to systems used and the reasons behind their preferences. This helped to ascertain the number and ratio of libraries that use OSS or commercial software and establish the actual requirements and factors considered by these libraries when selecting ILS for their libraries.

### **Findings of preliminary study**

The questionnaires were sent to 138 potential respondents from 49 different libraries (Appendix 1). The study needed views and experience of the library professionals from both personal and institutional perspectives. Some of the respondents were therefore selected because of their declared interest in OSS. The feedback received represented a 15 per cent percentage of the expected response rate. In total 21 questionnaires were

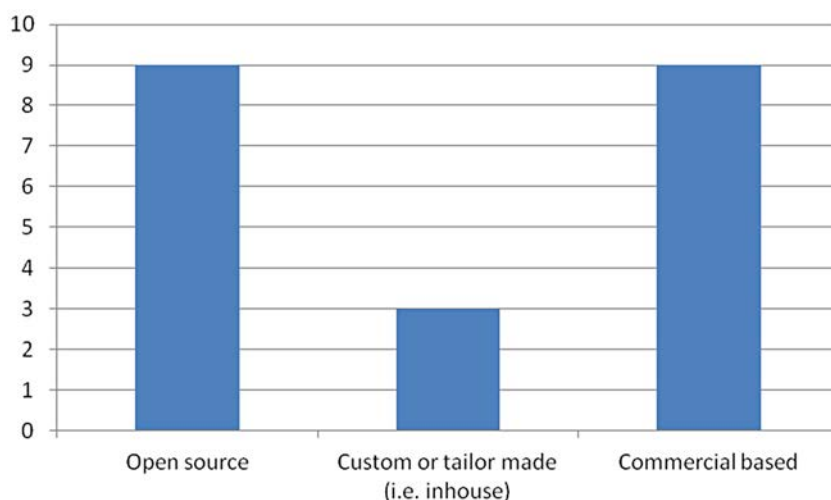


**Figure 1.**  
Types of libraries in the  
sample

completed and sent back for analysis by the set deadline. Out of these 17 were from different institutions from the sample group. The other four respondents did not provide details of their institution; however, based on the contact details provided by the 21 respondents, there were no multiple institutional entries – so the views were considered to be both personal and institutional, depending on the answered questions.

### *ILS in Kenya libraries*

There was a 50-50 distribution of libraries that had OSS and commercial based software for their ILS. Only 14 per cent of the libraries had custom or tailor made library systems, of which two libraries had their tailor made system installed by a vendor or consultant. Only one of the three libraries said that their tailor made system was installed by a library staff member (Figure 2).



**Figure 2.**  
The different ILS grouped  
into three clusters



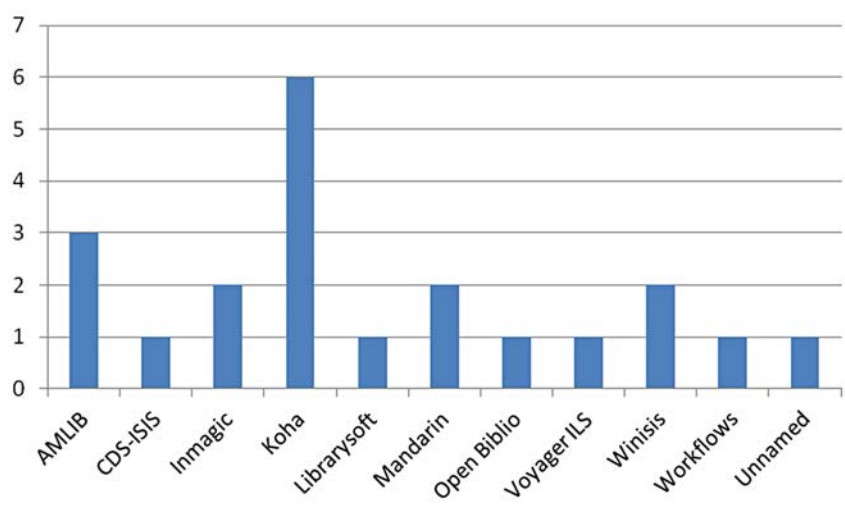
Some of the ILS software used in Kenya’s libraries include AMLIB, CDS-ISIS, InMagic, Koha, Librarysoft, Mandarin, Open Biblio Voyager ILS and Winisis. Figure 3 shows the number of respondent libraries using each of these software systems.

There were some ten different types of OSS library systems provided by the respondents as being installed in their libraries. However, Koha seem to have more users compared to the rest at 28.5 per cent of the overall systems installed – regardless of type (open, closed or custom made). The software with the lowest users in the group were CDS-ISIS, Librarysoft, Open Biblio, Voyager ILS and Workflows at 4.7 per cent. AMLIB, a commercial based software also had sizeable number of libraries that had it installed – a 14.2 per cent usage rate. Open source ILS installed in the sampled libraries were three, namely – Koha, Open Biblio and Winisis and 67 per cent, the majority had installed Koha in their libraries (Figure 4).

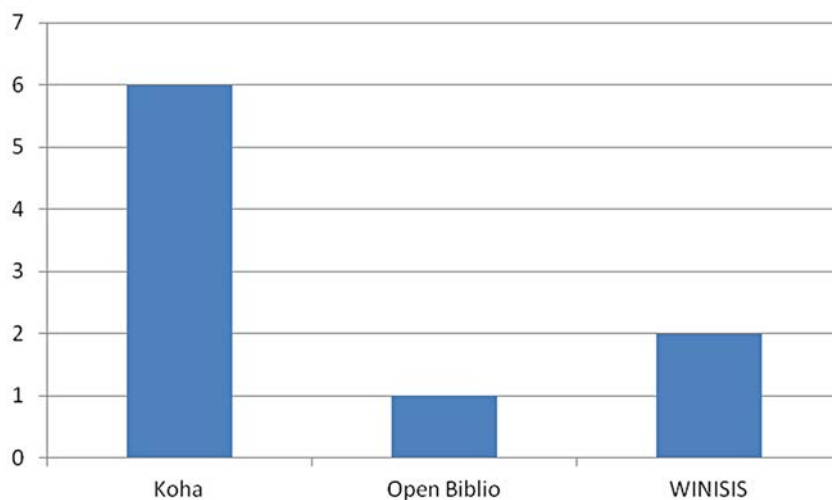
Regardless of what systems were installed in their libraries, the respondents specified which OSS they were familiar with; 67 per cent of the respondents have either worked with or are familiar with Koha. This was followed by Open Biblio at 24 per cent.

Of the nine, almost 50 per cent of the sampled libraries that had commercial based ILS, had more variety of types of software compared to those with the open source. As shown in Figure 5, the libraries had five different types of commercial based ILS software installed. AMLIB, which was developed by an Australian software development company that specializes in library and knowledge management software solutions for government, education and corporate libraries, had the highest usage rate at 33.3 per cent of the group of libraries with commercial based ILS.

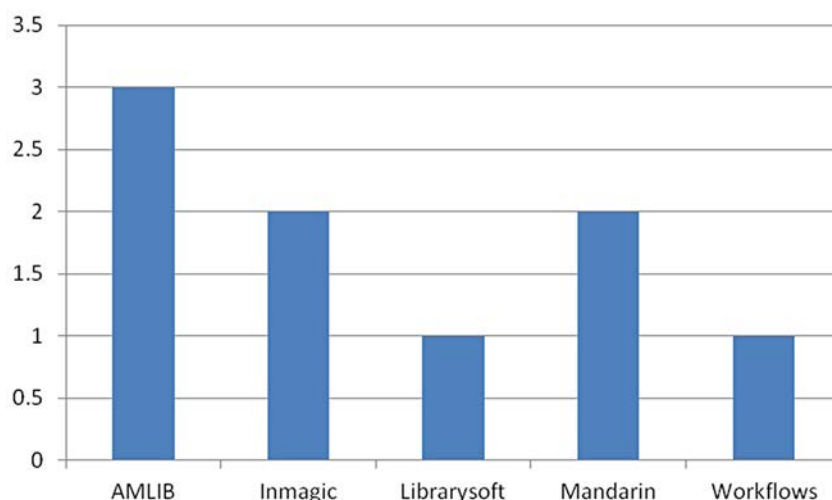
A majority of the libraries that had installed OSS are academic which coincidentally has the largest user group and information collection compared to the rest. The other libraries which stated that they had installed open source ILS were either research or special libraries (Figure 6).



**Figure 3.**  
Names of ILS installed in  
the sample group



**Figure 4.**  
Distribution of OSS used  
within the sample group



**Figure 5.**  
Distribution of commercial  
based software used  
within the sample group

### *Factors that determine choice of ILS*

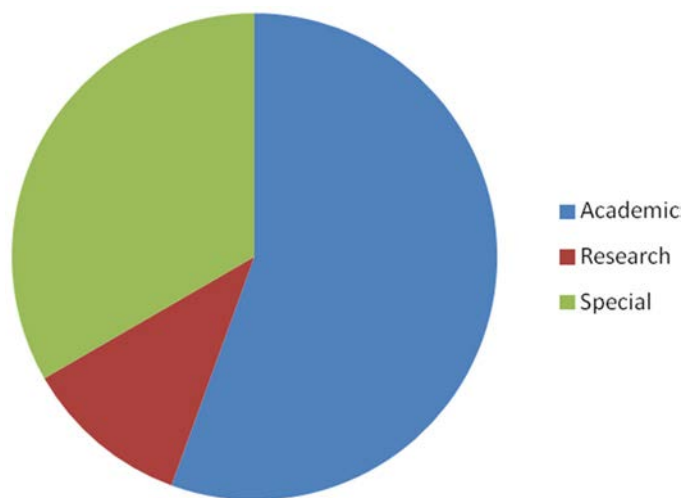
The respondents were asked to state factors that contributed to their decision making process when selecting their current or any ILS for their libraries; 62 per cent said that the librarian (or staff heading the library) was directly responsible for selecting and deciding on the type of system to acquire and implement in their library and 4.8 per cent of the respondents who were librarians were not responsible at all. They were not involved or consulted when their system was acquired even though it was the library staff that had the commercial based system installed and 28.5 per cent of the group who were library staff admitted to have been indirectly responsible for the selection. They did not specify, except for one, the extent of their responsibility.

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**Figure 6.**  
Sample group libraries  
with OSS

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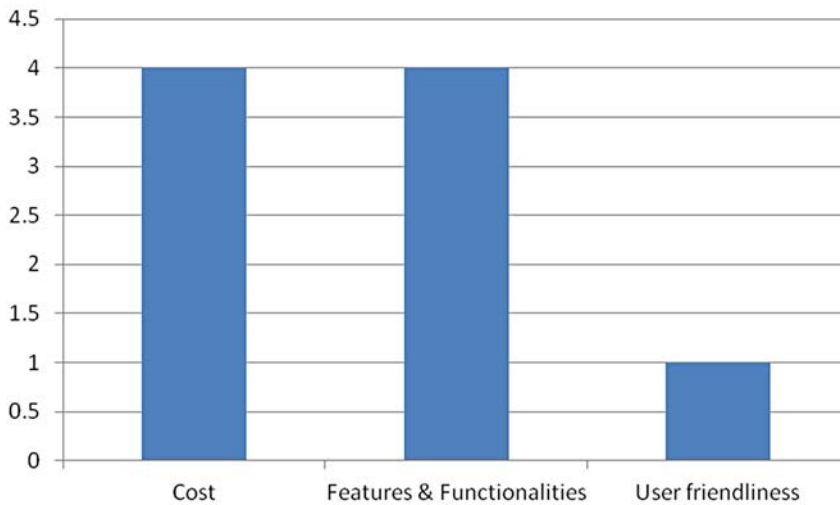
They were asked to select which from the following 11 factors determined or influenced their selection of ILS for their libraries:

- (1) cost;
- (2) ease of deployment;
- (3) features and functionalities;
- (4) performance;
- (5) platform (operating system);
- (6) quantity/volume of library material;
- (7) security;
- (8) staff training;
- (9) system support;
- (10) user friendliness; and
- (11) vendor viability.

Out of the sample group, the two main factors that were outstanding were cost and functionalities (Figure 7). These two are the main considerations for the libraries when selecting software for library processes or functions. Interestingly, there were also an equal number of respondents who felt that cost was not a major determinant during the selection. See Table I for the comparisons.

From the responses received, the majority at 42.8 per cent considered the features and functionalities of the systems to be the most important factor during the selection. Cost was another factor for 38.1 per cent of the libraries. Other factors that featured were the system user friendliness and operating system.

The factor that was considered as least important by one-third of the group was the cost element. The functionalities and features of the system seem to be of greater importance to these libraries. Other factors that were not of great importance out of the



**Figure 7.**  
When selecting the OSS,  
which of 11 listed factors  
influenced your decision  
most?

Which of these factors influenced your decision	
Most	Least
1. Features and functionalities = 42.8 per cent	1. Cost = 28.5 per cent
2. Cost = 38.1 per cent	2. Platform (operating system) = 14.3 per cent
3. User friendliness = 9.5 per cent	3. Quantity/volume of library material = 14.3 per cent
4. Platform (operating system) = 4.7 per cent	4. Vendor viability = 14.3 per cent
	5. Security = 9.5 per cent
	6. Performance = 4.7 per cent
	7. User friendliness = 4.7 per cent

**Table I.**  
Factors that influence  
selection of ILS in the  
libraries

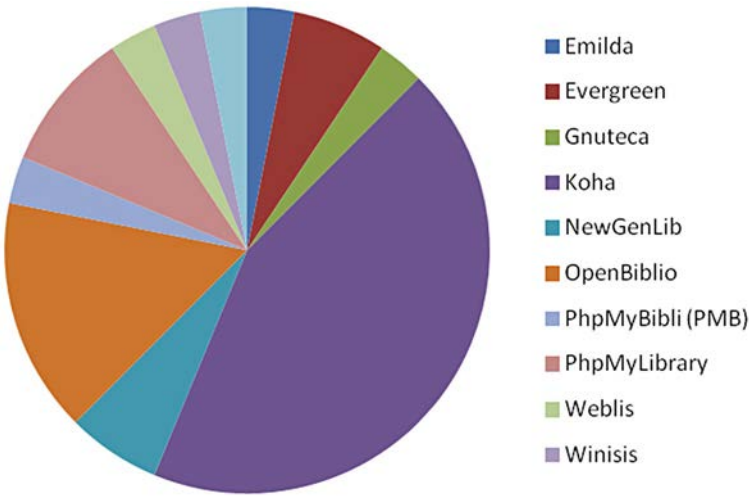
11 listed factors were the prevailing operating system, volume of library material, vendor viability, security of the system, performance and user friendliness.

#### *Potential of OSS in Kenya libraries*

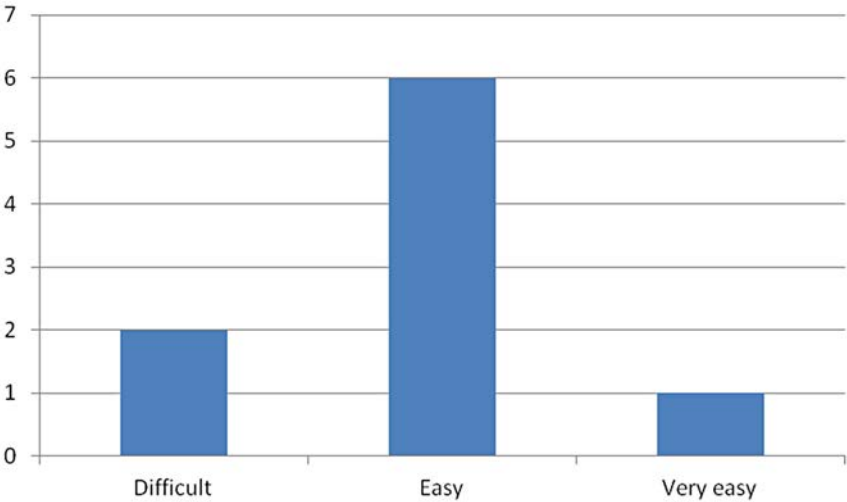
From the sampled group, it is clear that OSS has gained sufficient momentum for it to be taken seriously in Kenya's libraries. There is a shift towards open source, to Koha to be precise. The reasons for this may be varied, but of importance is that this shows that there is great potential for OSS in Kenya. Because of the budgetary constraints evidenced in majority of libraries in developing countries, OSS would be an affordable option at the outset for libraries that wish to automate their processes, but have the necessary expertise for installing and implementing.

Figure 8 shows all the different OSS which the respondents named as being familiar with or having worked with – with Koha being the most popular in the sample group.

When asked about installation – a common challenge with OSS, the majority of the respondents whose libraries had implemented OSS for their ILSs, responded that it was either “easy” or “very easy” (Figure 9). 29 per cent of the respondents had their installations done solely by library staff while the rest were either done in collaboration



**Figure 8.**  
The different OSS  
mentioned by librarians



**Figure 9.**  
How did the libraries with  
OSS find the installation  
process?

with IT department staff or by vendor or consultants. Of the 29 per cent, they all find installation of their open source ILS to be easy.

In total, 71 per cent of the group had had an experience with both open source and commercial based library software and were thus well placed to compare and contrast. Their opinions and views regarding the potential of OSS in Kenya were captured in the questionnaire and tabulated as shown in Table II.

**Issues resulting from findings**

Based on the survey findings, some issues that may need to be addressed, in relation to the individual opinions gathered about OSS for libraries, include:

Statement	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
1. Open source philosophy matches with libraries' mission and objectives in a broader sense	0	5	10	43	38
2. OSS are good choice for libraries to adopt	5	0	5	33	52
3. OSS are economical solution for technological application in libraries	0	0	0	43	52
4. Staff of libraries in Kenya are competent enough to implement OSS	19	19	19	33	5
5. OSS development includes sharing of knowledge and skills	5	0	5	24	62
6. OSS development includes to learn and develop new skills	0	0	10	33	52
7. OSS model improve job opportunities	0	14	14	24	43
8. OSS development/adoption is to participate in a new form of cooperation	0	5	5	43	38
9. OSS low-cost solutions for libraries	0	5	5	38	48
10. OSS provide flexibility to customize according to local needs of libraries	5	5	10	14	67
11. OSS movement gives librarians an opportunity to become more active in determining the future development of the software they use, rather than letting vendors keep control	0	5	10	33	38
12. Low start-up cost associated with using OSS is a main attraction to use	0	10	0	52	29
13. OSS approach provides more flexibility and a better match to libraries' requirements	0	5	5	43	38
14. OSS cause an increase in staff expertise through involvement in new developments	0	5	19	14	52
15. With no vendor responsible for the software, support for OSS applications can vary, and often depends on the user/developer community's commitment to the project	0	10	0	33	48
16. Level of technical knowledge needed to install and maintain OSS can also be a barrier to its use	5	5	5	33	43
17. OSS include poor quality documentation	10	19	33	24	5
18. OSS are less user-friendly than commercial software	29	48	10	0	5
19. OSS provide lower functionality than commercial equivalents	29	33	14	10	5
20. Large libraries are more likely to have staff with the necessary skills and experience to implement OSS	10	19	14	24	24

Feasibility of  
adaptation of  
open source ILS

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**Table II.**  
Kenya librarians' opinion  
of OSS for libraries

**Source:** Adapted from Rafiq (2009)



- competence of library staff;
- are there any additional benefits of using OSS in the libraries, e.g. job opportunities;
- overall cost of OSS;
- level of technical knowledge needed to install and maintain OSS;
- quality of documentation for training and support; and
- functionality of OSS vs the commercial equivalents.

In summary and despite these issues, 52 per cent of the respondents agreed that OSS is a good choice for libraries to adopt.

More libraries in Kenya are slowly embracing OSS. The establishment of new academic institutions to meet the high demand for higher education; and the requisite demand by the Commission for Higher Education (CHE) – a corporate body formed by parliament to oversee quality assurance in Kenya’s university education system – that these institutions have fully fledged libraries before they can be granted the authority to offer post secondary courses, have resulted in many libraries making more enquiries about OSS. This is due to the zero cost in OSS acquisition.

One of the CHE requirements is that “library system implemented must include on a minimum, modules for database creation and maintenance (cataloguing), Public Access Catalogue (OPAC) and circulation” (CHE, 2007, p. 10). This condition, combined with the high cost of acquiring and installing commercial based integrated systems and the apparent genesis to the open source option in Kenya has propelled more libraries towards OSS.

The apparent move to OSS by some of the Kenya libraries, over the last five years has also contributed to the stepped up interest in OSS. There is certainly potential for OSS in Kenya.

### Further research

To accurately establish the efficiency and effectiveness of open source ILS in Kenya, the researcher proposes that a study involving more library personnel and users be conducted. The same set of questions should be circulated to a bigger sample group. This will ensure a more definite representation of the entire library population. The next step will then be to establish:

- The comparison in product, integration, use, application and acceptance issues between open source ILS software and a closed/commercial alternative in a library.  
In their study, Singh and Sanaman (2012) tested two open source ILS based on an evaluation checklist consisting of ten functionality categories. These will be considered and tested at the application and acceptance stage of the next study. The ten categories are: characteristics of ILMS, general features, the technology in design and architecture, database features, core modules functionalities, format and standard implementation, software and digital content, ease to use and update, downloads and documentation and enhanced features (Singh and Sanaman, 2012).
- The appropriate model or steps for implementation of open source.
- The factors to be considered when anticipating adapting open source.

To answer the above, the researcher proposes to conduct a practical study of OSS that is renowned and popular, in this case, Koha; then compare it with commercial based software within similar conditions or structure. Koha is proposed as it seems to have a wider user group compared to the other listed systems within the sample group. Installation and configuration of OSS in a typical library is proposed for the next stage in order to accurately compare the overall cost and performance with that of a library whose ILS is commercial based. The case study will help to get concrete data that will assist in drawing conclusions that should support the research hypotheses. Koha, due to its popularity, will be installed and tested for quality, stability and compatibility. The systems administrators, library heads and library users of the two case libraries will be key in the evaluation process.

#### *Open source maturity model and business readiness rating*

In order to evaluate the systems accurately, without bias, the researcher proposes the use of evaluation tools that have been tried and tested. Evaluation parameters will therefore be drawn from two well known models – Navica open source maturity model (OSMM) and the Business Readiness Rating (Golden, 2005; Wheeler, 2007a). The parameters from the two models will be compared and used to compile a list of the measurable variables (Table III).

OSMMs are a formal process, published under an open license, that assesses the maturity of the key elements, including software, support, documentation, training, product integration, and professional services of OSS. Product element weightings are then applied before final calculation is done to establish overall product score. The software maturity and suitability is determined by the product score.

This method is said to be a quantitative and qualitative way to assess the strength of open source projects. This OSSM will be used to periodically measure and score the different parameters from installation, configuration and use in real life setting. Because some indicators cannot be measured in a purely numerical sense, the final scores will be determined in consultation with the library and IT personnel in the organizations. This will ensure that the scores are objective.

The proprietary ILS will also be graded using most of the OSSM parameters for uniformity. Obvious differences in the performance and functionalities of the OSS and COS will be taken into consideration at the final data analysis.

The score (s) of each indicator is multiplied by the respective priority (p). The total score of all the indicators for both the OSS and the COS are taken periodically since some indicator levels may vary with time. Indicators, like initial cost are constant. At the end of the research period, the product with the highest score – hopefully the OSS – will confirm or disqualify the research hypothesis.

Collected data and hands on experiment with actual OSS will help evaluate the cost effectiveness and support or disqualify this study's hypothesis.

*Expected outcomes.* The research outcomes will help formulate a model and guidelines to be used by systems librarians considering use of OSS for library processes. Factors to be considered when deciding on OSS will be outlined. The research project will seek to establish the technical, physical and personnel requirements for installation of open source and compare with those of commercial software. This investigation should bring to light the fact that:

EL 31,5	Indicator	Issues to be considered	Priority
624	Administration	The level of use of existing maintenance tools, the demands for operational management	3
	Documentation	User/administration guides availability	2
	Ease of deployment	Length of time required for installation and configuration	4
		Database setup	
		Ease of user orientation and period	
		Availability of maintenance documentation	
		Ease of migration: if moving from another software package, how hard is the migration process?	
		Is it likely that users will have a difficult time adapting?	
	Implementation	Which implementation scenario is preferred?	1
	Interfacing	Required connectivity, which standards are applicable. How does this fit into the organisation?	4
		Relation with other organization systems. Any concurrency?	
		Legal/license issues: legal restrictions and fees	
		Compatibility: does the software use file formats and communications protocols that are based on widely accepted open standards? Is it compatible with other systems you are using?	
	Performance	The expected load and processing capability. The performance demands that must be met	
	Functionality: system capabilities and functions	Does the product use technology that has proven itself in daily production?	
	Staff satisfaction	How hard is it to customize and adapt the software to your organization's needs?	
	Add-ons and full potential of system	Will the software grow with your needs? Is it scalable?	
	Proven technology	Is the product available for particular ICT environments only, or does the product allow a wide range of platforms?	2
	Flexibility	What level of availability is the product delivering?	4
	Platform independence	Stability: does the software crash often? Is a lot of effort required to maintain it and keep it running?	
	Reliability	What reporting facilities are required?	1
	Reporting	Frequency of systems outages, types of reports generated by systems to assist in decision making	
	Security	What security measures are required, what restrictions are imposed onto the product?	4
	Staffing	Is product expertise bought, taught or hired?	5
	Support	What level of support is offered?	4
		How active is the project's community, and what resources are available to support new users of the software?	
		What support is there within the library and its parent organization for the open source philosophy, and at what level?	
	Training	Required training and facilities	2

(continued)

**Table III.**  
Default OSMM  
measurable indicators  
and their priority ratings  
based on the two models

Indicator	Issues to be considered	Priority
Usability	<p>The intended user audience, the experience of that group</p> <p>User interface friendliness</p> <p>Ease of use: is the process of using the software intuitive and obvious given the skills of the people who will be using the software? Or is there a steep learning curve?</p> <p>When given a chance to test the software, how did users respond?</p> <p>Were they able to figure it out? Were they excited about the way the software worked?</p> <p>Is there evidence that others are using this software package?</p> <p>Does the popularity of the package seem to be increasing or declining?</p>	5
Vendor independence	The level of commitment provided by supplier/vendor to user	2
Cost	Total cost of ownership (initial cost, staff training, special equipment, upgrade costs, etc.)	2
	Total	50

**Source:** Adapted from Golden (2005) and Wheeler (2007a)

**Table III.**

- OSS is an economical alternative to libraries' reliance upon commercially supplied software. That is, despite the cost incurred in development, maintenance, and use of OSS software, they are still lower than those incurred with commercial software.
- OSS is essential if libraries are to develop software and systems that meet their needs. With OSS the IT infrastructure that is essential to library operations and services can be open and ubiquitously available to libraries. They may be tailored to suit the needs and circumstances of individual libraries and documented for future use/users. Errors can be also be identified and corrected.

Additional outcomes of the study would be:

- Establishment of current trends for adaptation of computerized ILS and the justifications for the same.
- Comprehensive evaluation of the economic and functional advantages of OSS as an alternative for the library in Kenya.
- Raising awareness about the potential value of OSS and to encourage informed decision making about potential investments in its development and use in Kenya libraries.
- A framework to support informed decision making about OSS by library systems and other technical staff who are involved in the day-to-day development or management of operational IT services in or for libraries.

- Establishment of a model for OSS installation and guideline to be used by systems librarians who are considering shifting to OSS in the library.
- Widen user community with persons who will add value and customize built-in modules of the OSS for optimal quality.

### Conclusion

Despite its fast growth and penetration in all sectors, it has been noted that OSS is yet to find its optimal place in libraries, particularly libraries in the developing countries. Lack of documented information on the experiences and use of open source ILS is a major drawback, which validates this study. A casual observation of the Kenyan situation reveal that the majority of academic, public and research libraries depend on commercial, free or tailor made systems. This scenario may be attributed to lack of knowledge (or interest) in OSS alternatives or insufficient expertise in their installation, implementation and maintenance. While there are quite a number of libraries and librarians worldwide that have shown great interest in OSS, the number that have installed them remains relatively low. There is a need to develop guidelines or a framework that local libraries can use to ensure that uptake of OSS in the libraries is well structured, consistent and easy to adapt, regardless of the type of library. This framework has to have sufficient evaluation mechanism depending on the individual library information systems requirement or desired specifications.

The first step has been to establish the status quo in regard to the ILSs that are installed in the libraries. This preliminary study has based its findings from data collected through questionnaires and it can be confidently stated that there is hope for OSS in Kenya libraries. The target group included library and IT personnel in the various institutions and the end-users within sample group. As a follow-up a full scale study after this initial study is proposed which entails a bigger sample and a case study based on Koha. The case study will help to accurately measure usability and cost effectiveness of a typical OSS for a comprehensive framework targeting all Kenya libraries.

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#### About the author

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#### Appendix 1. Sample group

- (1) Africa Medical Research Foundation
- (2) Africa Nazarene University
- (3) African International University
- (4) Aga Khan University
- (5) Catholic University
- (6) Communication Commission of Kenya
- (7) Daystar University
- (8) Egerton University
- (9) Goethe Institut
- (10) Inoorero University
- (11) Institute of Human Resource Management
- (12) International Centre of Insect Physiology and Ecology
- (13) International Development Research Centre
- (14) International Livestock Research Institute
- (15) Jomo Kenyatta University
- (16) Kabarak University
- (17) Kenya Agricultural Research Institute
- (18) Kenya Commercial Bank
- (19) Kenya Human Rights Commission
- (20) Kenya Institute of Administration
- (21) Kenya Institute of Management
- (22) Kenya Marine and Fisheries Research Institute (KMFRRI)
- (23) Kenya Methodist University
- (24) Kenya National Archives and Documentation Services

- (25) Kenya National Library Service
- (26) Kenya Polytechnic University College
- (27) Kenya Revenue Authority
- (28) Kenya School of Monetary Studies
- (29) Kenya Wildlife Society
- (30) Kenyatta University
- (31) Kisii University
- (32) Lake Victoria Basin Commission Secretariat
- (33) Library and Information Support Services (LISS)
- (34) Library of Congress
- (35) Maseno University
- (36) Moi University
- (37) National Museums of Kenya
- (38) Scott University
- (39) St Paul's University
- (40) Strathmore University
- (41) Tangaza College
- (42) Tropical Institute of Community Health and Development
- (43) Truth Justice and Reconciliation Commission
- (44) UN Habitat
- (45) United States International University
- (46) University of Eastern Africa, Baraton
- (47) University of Nairobi
- (48) World Agroforestry Centre
- (49) Zetech College

*Open Source Software and Integrated Library System (ILS) in Kenya*

Dear Respondent,

This is to kindly request for your cooperation in answering a few questions through this online survey. It will not take more than 15 minutes. I am collecting data to establish the current status of Open Source Software in Kenya's Libraries for a journal article.

The names of persons or institutions will not be divulged. My main interest is in the statistics and views related to the topic.

Your feedback before 1st March, 2012 will be appreciated.

Thank you for your time and contribution. Sincerely, Beatrice Adera Amollo

Mobile: [REDACTED]

**DEFINITIONS:**

Open source software (OSS) is a computer software whose source code is available under a license (or arrangement such as the public domain) that permits users to use, change, and improve the software, and to redistribute it in modified or unmodified form. OSS is free.

Integrated Library System (ILS) is an automated library system that is capable of managing the library's Acquisition, Cataloging, Circulation and OPAC operations.

**PART A**

1. Designation/Profession: .....
2. Name of Institution: .....
3. Type of Library or Information Service Centre \*
  - ☐ Academic
  - ☐ Public
  - ☐ Research
  - ☐ Special
  - ☐ Private
  - ☐ Other: \_\_\_\_\_
4. Approximately how many print book titles does your library hold? You may specify number in the 'Other' space
  - ☐ Below 2,000
  - ☐ 2,000-5,000
  - ☐ 5,000-10,000
  - ☐ Over 10,000
  - ☐ Other: \_\_\_\_\_
5. Email address: .....  
*This is important if you wish to receive an update on the outcome of this survey.*

(continued)

**Figure A1.**  
Questionnaire

## PART B: About your ILS

6. Do you have a computer based ILS? \*
  - ☐ Yes
  - ☐ No
7. If Yes, is it?
  - ☐ Commercial based
  - ☐ Open source
  - ☐ Custom or tailor made (i.e. in-house)
  - ☐ Other: \_\_\_\_\_
8. What is the name of the ILS installed in your library?  
.....

## PART C: Installation

9. Who installed your ILS?
  - ☐ Library staff
  - ☐ IT department staff
  - ☐ Vendor/Consultant
  - ☐ Other: \_\_\_\_\_
10. How did you/they find the installation process?
  - ☐ Very easy
  - ☐ Easy
  - ☐ Difficult
  - ☐ Extremely difficult
  - ☐ Not sure
11. How long did it take to install and implement the ILS?
  - ☐ Less than a month
  - ☐ 1-2 months
  - ☐ 3-4 months
  - ☐ More than 4 months

## PART D: Selection

12. To what extent were you responsible for the choice of ILS for your library?
  - ☐ Directly responsible
  - ☐ Indirectly responsible
  - ☐ Not at all
13. If you answered 'Not at all', who was responsible for making the decision? Give the title or department of the person(s), not name \_\_\_\_\_
14. What factors were considered when selecting the ILS? \*You may select more than one
  - ☐ Cost
  - ☐ Ease of deployment
  - ☐ Features & Functionalities
  - ☐ Performance
  - ☐ Platform (Operating System)

(continued)

Figure A1.

- ☐ Quantity/Volume of library material
- ☐ Security
- ☐ Staff Training
- ☐ System Support
- ☐ User friendliness
- ☐ Vendor viability
- ☐ Other: \_\_\_\_\_

15. Which of these factors influenced your decision most?

- ☐ Cost
- ☐ Ease of deployment
- ☐ Features & Functionalities
- ☐ Performance
- ☐ Platform (Operating System)
- ☐ Quantity/Volume of library material
- ☐ Security
- ☐ Staff Training
- ☐ System Support
- ☐ User friendliness
- ☐ Vendor viability
- ☐ Other: \_\_\_\_\_

16. Which of these factors influenced your decision least?

- ☐ Cost
- ☐ Ease of deployment
- ☐ Features & Functionalities
- ☐ Performance
- ☐ Platform (Operating System)
- ☐ Quantity/Volume of library material
- ☐ Security
- ☐ Staff Training
- ☐ System Support
- ☐ User friendliness
- ☐ Vendor viability
- ☐ Other: \_\_\_\_\_

#### **PART E: User Training**

17. How do/did you train users on how to use the ILS' OPAC? You may tick more than one

- ☐ Brochures/Pamphlets
- ☐ User manual
- ☐ User orientation workshops
- ☐ One on one session with users
- ☐ Online videos/demos
- ☐ Other: \_\_\_\_\_

#### **PART F: Experience with OSS**

18. Have you had the opportunity of working with both open source and commercial based software? \*This could be at different institutions and different times in your career

- ☐ Yes
- ☐ No

19. If you have worked with both within the same institution, which one of the two do you currently have installed in your library? You may tick more than one

- ☐ Open Source  
☐ Commercial based

20. Which of the following library based OSS have you worked with? You may tick more than one

- ☐ Avanti MicroLCS  
☐ BiblioteQ  
☐ Emilda  
☐ Evergreen  
☐ Gnuteca  
☐ Koha  
☐ NewGenLib  
☐ OpenBiblio  
☐ PhpMyBibli (PMB)  
☐ PhpMyLibrary  
☐ PMPLibrary  
☐ Other: \_\_\_\_\_

### PART G: Your Perception

Regardless of your previous answers, please select the option that corresponds to your level of agreement with each statement

	Strongly disagree	Disagree	No opinion	Agree	Strongly Agree
1. Open Source philosophy matches with libraries' mission and objectives in a broader sense.					
2. Open Source Software are good choice for libraries to adopt.					
3. Open Source Software are economical solution for technological application in Libraries.					
4. Staff of Libraries in Kenya are competent enough to implement Open Source Software.					
5. Open Source Software development includes sharing of knowledge and skills.					
6. Open Source Software development includes to learn and develop new skills.					
7. Open Source Software model improve job opportunities.					
8. Open Source Software development/ adoption is to participate in a new form of cooperation.					
9. Open Source software low-cost solutions for libraries.					

(continued)

Figure A1.



10. Open Source Software provide flexibility to customize according to local needs of libraries.					
11. Open Source Software movement gives librarians an opportunity to become more active in determining the future development of the software they use, rather than letting vendors keep control.					
12. Low start-up cost associated with using Open Source Software is a main attraction to use.					
13. Open Source Software approach provides more flexibility and a better match to libraries' requirements.					
14. Open Source Software cause an increase in staff expertise through involvement in new developments.					
15. With no vendor responsible for the software, support for Open Source Software applications can vary, and often depends on the user/developer community's commitment to the project.					
16. Level of technical knowledge needed to install and maintain Open Source Software can also be a barrier to its use.					
17. Open Source Software include poor quality documentation.					
18. Open Source Software are less user-friendly than commercial software.					
19. Open Source Software provide lower functionality than commercial equivalents.					
20. Large libraries are more likely to have staff with the necessary skills and experience to implement Open Source software.					

Additional comments?

Figure A1.