

Free software for library management and digital knowledge dissemination systems: another choice for libraries?

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Abstract:

The objective of this article is, first to differentiate between free software and proprietary software, also, to define free software and the different terms used in the literature, then to provide a history of free software, after which we will list the advantages and the disadvantages of free software and finally provide an overview of the solutions available in free software.

The methodology used in writing this article is descriptive and analytical method. We began by describing five free software or free library systems and two software of disseminating of digital collections by giving all their characteristics and differences and their advantages compared with a proprietary system. We conclude in the end of this paper that the libraries have more benefits to choose a free software to computerize their functions and to give access to their digital contents by using systems of dissemination of digital collections like DSpace or Greenstone.

Keywords:

Automation, Library; Software; Free Software; Digital Collection.

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1. INTRODUCTION

Choosing a software specialty for a library is a complicated process because there are so many computer solutions on the market, especially with the rise of open source programs that offer far more flexibility and customization options than proprietary software. The various functions of the library are covered, including the online posting of digital resources.

The purpose of this article is to first define free software, then provide a history of free software, after which we will discuss the advantages and disadvantages of free software and provide examples of the best known and accessible free software solutions.

The descriptive and critical methods were employed in order to shed light on the free library management software. After reviewing the history and origins of open source software, it becomes necessary to provide a precise definition of this kind of software in order to list the benefits and drawbacks of this kind of informational solutions for libraries by looking up information in the literature produced in this area and relying on these computer programs that are freely downloadable and customizable. These free library management tools have been introduced below, along with a summary of their key features. Two tools for managing digital collections have also been added, enabling the management of documentation, its retrieval, and its recovery through search interfaces based on various criteria.

Following a brief Internet search, we discovered that there were a certain number of free library management software programs available. We conducted our research in specialized computer documentaries, as well as on resource websites and official software documentaries' websites. We chose a few that deserved more examination after compiling enough data and comparing the software's fundamental features. The parties involved are Emilda, PMB, GNUTeca, Avanti, MoCCAM, Koha, Learning Access ILS, and OpenBiblio. Below is a brief overview of each, arranged from oldest to newest, along with a brief assessment of each. We have included a brief overview of Evergreen (formerly Open ILS). The presentation concludes with the introduction of DSpace and Greenstone, two programs devoted to the online dissemination of digital assets.

The question we posed at the outset of our investigation is this: what is the benefit of free library management software in terms of information services? And which people have been retombd in anticipation of their use?

Methodology: The approach we took to address these research questions was to describe the free software and compare the various programs by highlighting the features and drawbacks of each one that was offered.

2. Definition and History of Free Software:

Richard M. Stallman founded the Free Software Foundation (FSF) at Massachusetts Information Technology in 1984 and caled his GNU free software project.

A student named Linus Torvalds created Linux in 1991. Since its inception, Linux has continued to grow in popularity as it is increasingly utilized by a wider range of individuals, businesses, and institutions. Regarding library management software, the first free library

management software in the form of Koha was created in 1999 for the Horowhenua Library Trust by the Katipo society and subsequently "liberated" for public use. At the same time, Peter Schlumpf creates Avanti, another free program. (Berizzi, Zweifel, 2005).

2.1. Definition of free software:

We frequently confuse the terms "freeware", "shareware", and "public domain". The following definition outlines the characteristics of the three ideas: "Freeware software is published without charge, and anyone can obtain it for free." Commercial redistribution is prohibited. Additionally, the shareware is freely distributed, although in a simplified or time-limited version. To obtain a complete version, the user must purchase it. Regarding "public domain" software, it refers to software whose rights have expired. The user can obtain it for free without any other means, but there is a significant chance that the program will be abandoned at the source code level and that its publisher will no longer develop or maintain it. (Ibid)

These three software categories are distinguished by the fact that users cannot view the code source.

The English terms "free software," and "open source" have recently been added to these three concepts. Its source code can be consulted and altered, making it available to everyone and allowing for modification by anybody. (Ibid). Free software is essentially free, even though there are "packs" that cost money (especially for Linux distributions) that include installation CDs, a guide, and a set number of support days. Their foundation is the software's open source code, which encourages institutions and staff to appropriate data and the system. The Free Software Foundation provides a clear definition of the requirements that must be met for software to be deemed free. According to Richard Stallman, it must respect the four freedoms granted to users:

- The ability to run the application for various purposes (liberté 0).
- The ability to observe how the software operates and modify it to suit its needs (liberté 1).
- The ability to redistribute copies in order to assist potential users (liberté 2).
- The ability to suggest program improvements and publicize them to benefit the entire community (liberté 3). (Barré, Espiau, 2008).

2.1.1. Advantages of free software:

In contrast to proprietary (commercial) software, free software offers a number of benefits related to its freedom of use, some of which are as follows:

- Because the software's code is open and accessible to those with the necessary skills, quick changes can be made in the event of an error or improvement.
- Web interfaces, especially those used by free software, just require the use of a Web browser and an Apache server of the EasyPHP kind. It enables the OPAC to be personalized. In fact, the navigator considers translation and makes it easier in a variety of languages.
- The programming languages (MySQL, PHP, Perl, Python, etc.) are open source, well-known, and based on accepted standards.
- For the majority of software, cataloging standards and formats (MARC, ISO 2709, etc.) are taken into consideration.
- Free software is increasingly using XML, which greatly facilitates data movement and persistence.

Why Free software is more secure against viral attacks because developers can quickly identify and fix any faults.

2.1.2. Disadvantages of free software:

Choosing free software involves many risks and disadvantages that are important to keep in mind. Note, however, that these disadvantages mainly arise in the case of management by a single person. Team management can significantly mitigate these aspects:

2.1.3 Constraints of free software users:

- It is important that anyone who wishes to install and then manage free library management software has, in addition to their knowledge of library science, good prior knowledge of IT or that they have a competent IT specialist available in order to be able to manage the maintenance of the software independently.
- The user must regularly follow the development of the software via a mailing list or by regularly visiting the software website or forum.
- Similarly, the user should also devote time to the community and offer help according to their skills.
- Sometimes, when the development of software is not completed or there is only a beta version, the acquisition of the software may be chargeable to finance its development. This case is, however, quite rare.
- The time investment for the user is significant.
- Installing the software can sometimes be very laborious.
- Currently, the software available offers, for the most part, functions that are quite simple and sometimes not sufficiently efficient. We almost always find the cataloging and circulation modules and an OPAC. However, few software programs offer, for example, an acquisition or interloan module.
- Some software currently only offers beta versions, that is, versions that are still unfinished and unstable.
- Developers focus on creating new modules and sometimes “forget” to improve what has already been done.
- Some software, the oldest, is not very user-friendly and difficult to use even if it is often intended to be easy to use. The latest arrivals are much more convincing in this regard.

Interaction with proprietary software is not yet always achieved, nor is it possible to interact with free library management software. The choice of current software is very focused on “library management” and little on “documentation center management.”

3. Method: The method used to write this article is the descriptive method. We described and give a main characteristic of nine software for library management and two software used to disseminate resources in open access, and comparing them with making the focus about their functionalities.

4. Results:

4.1 Presentation of free software for libraries currently available:

4.1.1(Avanti: Avanti is, “basically, the work of a single person, Peter Schlumpf (USA) and dates from 1998. The goal was to develop software that was as simple as possible, flexible and did not require large computer knowledge to its users.

“Avanti Library Systems was born from an effort to create a simple open source flexible OPAC for small libraries.”(Library technology guides, 2022).

“The Avanti project was born in 1998 from an initiative by the American Peter Schlumpf, the network manager of the Mount Prospect library in Illinois, who wanted to develop a tool intended for small libraries. Avanti MicroLCS, the online public access catalog (OPAC) is programmed in Java and is still in beta today, does not offer an automatic installer and presents little documentation.

“Avanti is intended for the management of libraries which have a small collection (10,000 titles). Currently, it only includes a cataloging module and a public research module (OPAC). The currently available version does not support MARC formats. » University libraries in the South and free software for integrated library management.” (Gapihan B. and al., 2005, p. 37).

4.1.2- MoCCAM: “MoCCAM is free and open source software for networking libraries with different management software (SIGB).

MoCCAM uses the following technologies to network libraries:

- Merged database (periodic manual or automated export of records in UNIMARC or other format).
- Standard Z 39.50 (client and server).
- OAI protocol (harvester).

MoCCAM allows these functionalities:

- A Collective Catalog (possibility of simultaneously consulting the catalogs of several libraries on the Internet.
- Shared cataloging (possibility of exchanging records in UNIMARC format between libraries and retrieving records from major French libraries (BNF, BUs, etc.)

An alternative online catalog for network libraries: all libraries can offer online access to their own catalog by 'masking' the collective aspect.

MoCCAM, My Collective Catalog A Moi, “allows libraries to communicate with each other if they are equipped with different software. This project makes it possible to set up a

common catalog accessible via the Internet, shared cataloging (using exchanges of MARC records between the network's libraries), the retrieval of MARC records from Z39.50 servers, a customizable online catalog and a Z39.50 server. The interlibrary loan functionality is currently under development. This project is promising but is not yet sufficiently complete, particularly with regard to the administrative module.” (Ibid., p.114)

4.1.3- Koha: “Koha is a complete, Full Web SIGB, usable by libraries and documentation centers of all sizes and types, thanks to its very advanced configuration possibilities.

Koha offers an advanced Opac rich in 2.0 features, from tags to enriched content including reminders by SMS. ”¹

Koha is a project from New Zealand in which several international groups collaborate. The first version of Koha, dating from 2000, was developed at the request of the Horowhenua District Library, by a private company, Katipo Communications Ltd.

Koha is written in Perl, uses a MySQL database, requires a web server

Apache and is supported by many operating systems (including Windows, Linux, MacOS X, Solaris and UNIX).

Koha offers two interfaces: Koha intranet, which is the access module used by librarians and administrative staff within the library's computer network, and Koha OPAC which is the public search module used by library readers through the Internet network.

“Since December 2005, for reasons of performance and philosophical point of view, Koha has moved its tools from Sourceforge to Savannah. Specifically, Koha includes a catalog (MARC compatible, multiple grids, use of thesaurus and subject authorities), an OPAC (search on approximately ten fields, reader account, basket of records), a module for circulation management documents and readers, a simplified or complete acquisition module (management of budget, orders, suppliers, possible reader suggestions via OPAC, etc.), partially complete online help. Koha works with a web client, on Windows, Linux and MacOS, uses Perl languages for programming and MySQL for the database. It has a Z39.50 query protocol in version 2.0 and manages the UNIMARC, USMARC, MARC21 formats and the ISO 2709 exchange format. Recently, there has been a site bringing together several documentations concerning the installation, data migration or maintenance.” (Ibid., p.56-57). The type and presentation of Koha's features orient it more toward academic libraries. Used worldwide thanks to multilingual versions, Koha has a large community of developers, translators and correspondents.

4.1.4- LearningAccess ILS: The Learning Access Institute in Seattle offers free software called LearningAccess ILS. Formerly called OpenBook or Koha West, LearningAccess ILS was developed in 2000 by J.G. Bell based on the Koha code. Regarding the functionalities, there are three modules: OPAC, catalog (with use of MARC21) and traffic management. Acquisition management is still under development. The cataloging also includes the Z39.50

protocol. All modules work with a web interface and allow multilingual use. Technically, LearningAccess ILS runs on Linux or Windows and uses a MySQL database, the PHP programming language and Unicode.

4.1.5- GNUTeca: The GNUTeca project started in 2001 thanks to three Brazilian developers. It is very successful in Brazil in public universities and even government libraries. The number of programmers has increased and the current version offers an OPAC, a MARC21 compatible catalog, circulation management, bulletining and inter-library loan. GNUTeca runs on Linux, uses the PHP and PostgreSQL programming languages and uses a free Portuguese database language: Miolo.

“Gnuteca is a system for automating all processes in a library, regardless of the size of its collection or the number of users. The system was created according to validated criteria developed by a group of librarians and was developed based on testing of an actual library, the University Center, which has been operating since February 2002. (...). The software complies with standards known and used by many libraries, such as ISIS (UNESCO) and MARC21 (LOC - Library of Congress).

Because it was developed in a CDS/ISIS environment, Gnuteca offers easy migration of these collections, and several others. The system can be used both in the management of small individual collections, and for collections of more than 100,000 copies. Being free software, and relying on other free software only, there is no practical limit to the number of service stations, islands to query or access through the Internet.” (Gestion des bibliothèques avec Gnuteca, 2022).

4.1.6- PMB: PMB, initiated by the French librarian François Lemarchand and currently developed, run and maintained by the company PMB Services, dates from 2002.

In version 2.0, it offers an OPAC, document and reader circulation management, a catalog (MARC compatible) with authority management, cataloging of electronic resources, periodical bulletins, and a multi-criteria and Boolean search engine. We can also have access to fairly complete documentation online.

Similar to Koha, PMB is based on technologies from the Web: Apache server, PHP programming language and MySQL for database management. Finally, it uses the Z39.50 protocol and manages the UNIMARC format as well as the ISO 2709 exchange format. The software, already available in several languages (French, English, Italian, Spanish, etc.), works very well on Windows, Linux and MacOS, single-user, Intranet or Internet. The software is regularly updated, and the latest version dates from January 2005.

The interface is very simple and user-friendly for both users and professionals. PMB targets small and medium-sized SIDs as well as specialized documentation centers but

already equips libraries with 180,000 books and a documentation center with 300,000 documents.

“The cataloging module allows you to catalog all types of documents. Entry of notices is done in a form. The records are not in UNIMARC. However, PMB allows the import and export of records in UNIMARC format. It complies with standardized protocols (compliance with ISO 2709 and client Z 3950). Thesaurus loading is proposed. Indexing lists are also downloadable. PMB has three possible indexing options: a Dewey (the UNIMARC 676 field), a free indexing (the UNIMARC 610 field), an indexing by subject words (the UNIMARC 606 field).” (Gapihan B. and al., 2005, p. 48).

4.1.7- OpenBiblio: Fairly recent software (2002), OpenBiblio offers the classic functionalities: OPAC, circulation, catalog and reader management. There is also an employee management module. The software works with a MySQL database, the PHP programming language, on Linux, Unix and Windows and manages USMARC. This software is quite intuitive, pleasing to the eye, well documented (presence of a user forum) and easily installable. Several translations are underway, notably in Spanish, Italian, French, Hebrew or Indonesian. There is no final version yet, the current version being beta version 0.5.0. The software is currently mainly used in the United States.

“The Openbiblio software is under the GNU-GPL license, free and open source. The version currently available is 2.1.0. OpenBiblio is an application written in PHP and relies on Apache and MySQL software. It works in web mode. The software was analyzed using online documentation.

It allows you to catalog and lend documents. (...). It does not support MARC formats or the import and export of records. It allows the management of loans and readers. There are two categories of borrowers (students and classes). The software does not include the notion of a multisite library. Editing catalogs based on inventory number, rating, etc. not possible. However, it is possible to edit listings of classes, borrowings and returns of the day. It allows you to establish statistics on books, students and classes (according to the elements entered in the cataloging grid: genre, condition, location, etc.). The software is ergonomic, user-friendly and easy to use.

However, OpenBiblio is a program for managing a (primary) school library. It is therefore designed for a specific audience. Additionally, this “basic” software does not seem to meet the needs of university libraries.” (Bwalya, 2017, p.37).

4.1.8- Emilda: “Emilda was created in the fall of 2000, is developed by the Finnish company Realnode. The software is under the GNU-GPL license. Now released in version 1.2.1, it is constantly evolving. The Realnode website offers an online demo, which allowed the software to be tested, and extensive documentation.

Emilda presents the characteristics of a traditional SIGB. It is therefore equipped with a cataloging module and a loan module. Its OPAC is quite user-friendly and has a help window. For cataloging, it follows the MARC format.

However, Emilda was not selected by our research group. In fact, certain criteria in the grid, considered essential, are not met. For example, the software does not allow you to search by subject, which seemed prohibitive to us. Additionally, Emilda is not available in French. For a non-English user, the software therefore lacks ergonomics. However, the program is relatively young and will experience new developments. Its future developments will need to be monitored carefully.” (Gapihan B. and al., 2005, p. 44).

Some of the main features of Emilda are as follows:

- Complete web-featured OPAC, which allows management of the overall system from virtually any computer with an Internet connection.
- Template based layout allowing anyone to modify the visual appearance of Emilda.
- 100% MARC compatibility with the Zebra Index data server as primary server.
- Extensive configuration made easy with the Emilda configurator, allowing complete system customization.
- Currently, Emilda is used at 14 schools in Espoo, Finland.” (Scopsi, 2010, p. 11).

4.1.9- Evergreen: The Evergreen Project was initiated by the Georgia Public Library system in 2006 to serve their need for a scalable shared data catalog by (as of now) approximately 250 public libraries in the state of Georgia. After Evergreen was released, it has since been adopted by a number of library consortia in the United States and Canada as well as various individual libraries has begun to be adopted by libraries outside of North America.

The Evergreen development community is relatively small, with approximately nine active committers and around 50 people who have contributed patches (as of March 10th, 2011). However, the Evergreen community is also marked by a high degree of participation by librarians who use the software and contribute documentation, bug reports, and organizational energy.

Due to the nature of ILS, Evergreen has an interesting mix of functionality:

“Evergreen is a metadata search engine,
Evergreen is a transaction processing engine,
Evergreen * is nothing other than a web application,
Evergreen* is based on a robust and scalable messaging framework” (Evergreen: open source library software, 2022).

Below, Table 1 indicates the characteristics of the free software listed in this article.

Software	Main Features and Functionalities										
	Operating system	Database system	Cataloging	OPAC	Opac 2.0	Library size	loan	ILL	Z 39.50	Unimarc	OAI Protocol
Algerian Journal of Manuscripts											
Avanti	Java	PicoDB		✓		10 000 titles					
MoCCAM				✓		Any type of library	✓	✓	✓	✓	✓
Koha	Windows, Linux, MacOS X, Solaris, UNIX	MySQL	✓	✓	✓	Academic libraries and documentation centers	✓		✓	✓	
LearningAccess ILS	Linux or Windows	MySQL	✓	✓		Any type of libraries	✓			✓	
GNUTeca	Linux	Portuguese free database language: Miolo	✓	✓		Any type of libraries	✓	✓		✓	
PMB	Windows, Linux and MacOS	MySQL	✓	✓			✓		✓	✓	
OpenBiblio	Linux, Unix and Windows	MySQL	✓	✓		School libraries	✓			✓	
Emilda			✓	✓			✓			✓	
Evergreen			✓	✓		Public libraries	✓	✓			✓

Table 1
Main characteristics and functionalities of the free software used in the study
Source: Produced by the author

5. Digital Knowledge Dissemination Tools:

Libraries are becoming more and more dependent on digital knowledge dissemination tools in addition to integrated library administration systems. In fact, a lot of organizations want to provide their customers with digital access to papers. This is especially necessary in the realm of telelearning, where students' physical proximity isn't always suitable.

5.1.1-Greenstone: This software suite is used to create and share digital library collections. It provides a fresh approach to publishing and organizing data on CD-ROM or the Internet. The University of Waikato's New Zealand Digital Library Project created and disseminated Greenstone in association with UNESCO and the non-governmental organization Human Info. The GNU General Public License governs the publication of this multilingual, open source software. (Software for the Greenstone Digital Library, 2022).

Greenstone software's objective is to empower its users—especially academic institutions, libraries, and other public institutions—to create their own digital libraries.

Greenstone's multilingualism is one of its advantages. Arabic, Armenian, Bengali, Catalan, Croatian, Check, Simplified and Traditional Chinese, English, Farsi, Finnish, French, Galican, Georgian, German, Greek, Hebrew, Hindi, Italian, Japanese, Kazakh, Kyrgyz, Latvian, Maori, Mongolian, Portuguese (BR and PT versions), Russian, Serbian, Spanish, Thai, Turkish, Ukrainian, and Vietnamese are among the languages in which the user interface is accessible.

The complete Greenstone documentation, including the librarian interface, is available in English, French, Spanish, and Russian.

But the main purpose of Greenstone is to create a documentary basis of digital materials in various formats. As a result, this program is especially designed for organizations that already have a physical document management system in place but now need to handle more and more crucial digital documentation.

5.1.2- DSpace: Hewlett-Packard and the Massachusetts Institute of Technology collaborated on DSpace. This program is a digital repository designed specifically for research and education institutions. DSpace makes sure that digital records of all kinds are gathered, archived, studied, and shared. The "Berkeley Standard Distribution License" governs the distribution of this software (DSpace, 2018).

All document formats and types, including forms, technical reports, dissertations, conference articles, and even images, are supported by DSpace. This program also makes use of the Open Archive Initiative's Protocol for Metadata Harvesting and the Dublin Core standard for metadata.

DSpace is a program used by both commercial and nonprofit organizations to create digital collections. It is free, simple to set up, and adaptable to the requirements of the organizations that use it. Open access to digital content, such as text, photos, and data, is made possible by DSpace. Research libraries with institutional repositories are among the 1,000 organizations that use DSpace.

6. Discussion:

Library management software generally offers several modules, such as circulation (loan), cataloging, catalog search, acquisitions management, periodical bulletins, administrative management functions, statistics or even an OPAC (Online Public Access Catalogue).

After a brief internet search, we found that there were a number of free library management software programs available. We deepened our research in specialized periodicals (Argus, Archimag, Documentaliste, etc.) but also on resource sites and on the official sites of documentary software. After gathering a sufficient corpus of texts and comparing the basic functionalities of the software, we shortlisted seven that were worth studying slightly more closely. These are Avanti, Koha, MoCCAM, Learning Access ILS, GNUTeca, PMB, OpenBiblio, and Emilda. We briefly present them in the table above, in order from oldest to newest, with a succinct review of each. We have added a brief presentation of Evergreen.

7. Conclusion:

With the development of free software and the proliferation of experiences and applications of these programs with various enrichments, it would seem that the future of software use would be turned toward this type of freeware, thereby avoiding heavy investments for the automation of recurring redundant and tiring tasks in various fields and in particular in the field of information and libraries.

With international collaborations and a willingness to make continuous improvements, free software tends to play a leading role in all act.

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