GALALA UNIVERSITY
Powered by
Arizona State University

Open-Source Software in Academic Libraries: Benefits & Service (Galala University) Case Study

By: Mohamed Sayed Ibrahim

Abstract

Open-source software (OSS) has become one of the topics that several fields due to the high cost of closed-source software. In addition, the technical support for such software is limited to the software-producing company. As for open-source software, its technical support is not limited to a company or a group of individuals, but there has become a community of open-source software, this paper expresses the definition, benefits, and concept revision of OSS for libraries community from the perspective of security & technical support.

Description of open-source software within Galala university as represented in the institutional digital repository (DSpace) and library management system (koha) in the period from 2021-2022 with a description of the services provided by these open-source software.

As a result of the description and the data that were dealt with in the search for a solution and to clarify the big difference between open-source software and closed-source software from the financial aspects of reducing their budget, in addition to the technical aspect and the ability to develop easily and this leads to the most important point, which is the ease of actability, both in everything related to the installation of the system, how to use, and technical problems.

It is expected that open-source software is the future in all fields, and it is not limited to the specialization of libraries, as there is much software, including (Odoo), which is an Enterprise resource planning (ERP) system used in the administrative field to manage institutions and is used within the University of Galala.

Introduction and definition

In this introduction explain the overview of Open-source software (OSS).

First the definition of (OSS) that we found more than one definition but all this speak about major topics is it free & accessibility & development.

For examples of definition in 1997 Bruce Perens established The Open-Source Definition and published it in Debian Free Software Guidelines with many licenses and condition for examples Free Redistribution & Source Code & Distribution of License and another condition (Kavanagh, 2004).

Second, the purpose of this paper or why at this time we chose this topic, there are many reasons for that, but we believe that the main reason is financial funding because closed software has a high cost and in third world countries it is not easy to provide the financial cost and that is why we explain the greatest benefit from software Open source is low cost.

Comparison between open and closed source

There are many values used for comparison between open and closed source but I will use some distinct issue categories so I will explain 5 them cost, service, support, innovation, usability Security (Lile, 2015).

1. Cost:

The first difference between any open and closed system is the financial way.

So, when we speak about the close source, we found the large cost for example for the library system the cost average is More than 250 thousand Egyptian pounds.

Of the open-source many of them is free but there is some system it cost the free system we speak about koha another system cost, for example, the Odoo ERP system there are two version community is free another enterprise cost between 50 and 60 thousand Egyptian pounds.

Finally, in this distinct, the open source is best from a financial perspective.

2- Service and Support:

For the closed system, the technical support and services for the system belong to the company that created the system and also according to the joint contract between the parties, and this shows that it is available and may be free of charge or for a fee, as I explained by the contract between the two parties.

For the open sources the technical support and services for the system are mostly on its online community, for example, koha library system "https://koha-community.org/" you will find all technical issues and services and completely explain the system form installation to all features and it is available for 24 hours but think there are little issues there are some technical issues need the expert for solving it but there many companies and personal support the system with little cost.

Finally, in this distinct, I found there is no big different between the two kinds of system.

3- Innovation (development):

For the closed system, the Innovation or development of the system belongs to the company that created the system it takes many big of effort and money, and time because it is specific to the developers and programmers of the company how matter what they count. For the open sources system, the Innovation or development is very quick and there are no expensive money and effort because there are many developers and programmer all around the work together to give more and more development and update for the system for example when we speak about koha we found that from 2009 to 2022 over 13 years there is from koha 1.03 to koha 22.05 more than 10 versions and from one version there is 3 or 4 subversion for example from koha-20.11.16 to koha-20.11.19. (https://download.koha-community.org/)

Finally, in this distinct, the open source is best for time & development and a variety of programmers and developers around the world.

4- Usability:

For both systems there are manuals for how to use the system and how the users deal with the system and for the admin there are manuals for it.

5- Security:

In this distinct, all commercial or closed system companies stand on that the open source is very low security but also many of these companies speak that there is no security in the open source so we have here a big question Is Open-Source Software Secure? In this part, we will explain and answer this question.

The Closed source advocates building the mindsight to attack the open source in that the source code of the system is available to every so you can be hacked so they think it easy to drop down the system so which mean it is less security.

From this point "The security through obscurity" we will drop allegations of the closed source advocates (*Clarke,*).

This point clarifies that the advocates of open sources see that their systems are more secure, through the presence of many opinions that show that the availability of data reduces the penetration of systems and that ambiguity and obscurity do not mean that it is more secure, and therefore this does not mean that closed systems are more secure, and the availability of data may

Mount Attaka, Galala City,
Suez Governorate. Egypt
Info@gu.edu.eg
www.gu.edu.eg

help greatly. To provide rapid development in the systems and also, which makes reducing the incentive for the intruders to target those systems and therefore can use this point (*Clarke,*).

Finally, in this distinct, I found there is no big different between the two kinds of system.

Distinct	Open source	Closed source
1.Cost	low	high
2.Service and Support	Easy way from the community	Easy way from the installation company
3.Innovation (development)	Less time and fund	Take time and fund
4.Usability	Easy way from the community and manual	Easy way from the installation company and manual
5. Security	Good	Good

* From this comparison, I found that open-source software best than closed-source software from the five distinct I take it in comparison.

<center>Comparison between koha and Symphony</center>

-user installation

-implementations by Type of Library
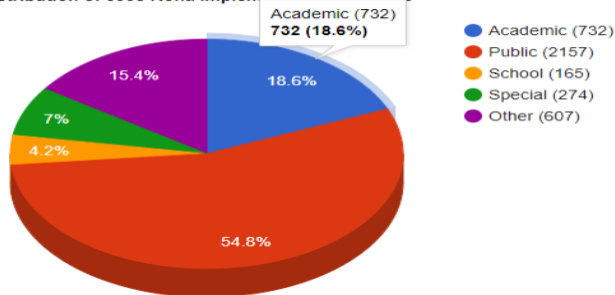
-System migration patterns

- Satisfaction Ratings

<center>(Koha)</center>

- user installation: Koha has been installed in 3,935 libraries, spanning 5,471 facilities or branches)

![Galala University logo] GALALA UNIVERSITY — Powered by Arizona State University

- implementations by Type of Library:

Distribution of 3935 Koha implementations by Type

Academic (732)
732 (18.6%)

- 18.6%
- 54.8%
- 4.2%
- 7%
- 15.4%

- ● Academic (732)
- ● Public (2157)
- ● School (165)
- ● Special (274)
- ● Other (607)

Type	Libraries	Facilities
Public	2157	3132
Academic	732	959
Special	274	295
School	165	407
Others	607	
Total	3935	5471

(Library Technology Guides:2020.)

-System migration patterns :

Previous systems used by the 3935 libraries migrating to Koha (counting number of institutions)

Other

Milas (958)

- ● Milas (958)
- ● Symphony (284)
- ● Koha -- LibLime (245)
- ● Millennium (96)
- ● None (80)
- ● Voyager (77)
- ● Polaris (59)
- ● Koha -- Independent (54)
- ● Library.Solution (52)
- ● Horizon (48)
- ● Winnebago Spectrum (33)
- ● PallasPro (33)
- ● Origo (32)
- ● CDS/ISIS (29)
- ● Destiny (27)

▲ 1/5 ▼

(Library Technology Guides:2020.)

- Satisfaction Ratings

Statistical Report for Koha

2022 Survey Results															
Product: Koha					**Response Distribution**								**Statistics**		
Category	**Responses**	0	1	2	3	4	5	6	7	8	9	**Mode**	**Mean**	**Median**
ILS Satisfaction	75		1	1				5	17	31	20	8	7.73	8
ILS Functionality	75			1			2	2	16	38	16	8	7.79	8
Print Functionality	74			1	1	1		2	12	36	21	8	7.86	8
Electronic Functionality	71	4	1	2	3	3	6	8	16	16	12	7	6.37	7
Company Satisfaction	73			1	2	1	1	3	14	23	28	9	7.79	8
Support Satisfaction	73	1		2	1	2		2	14	18	33	9	7.75	8
Support Improvement	0											0	0.00	
Company Loyalty	73	3		1			2	2	13	13	39	9	7.86	9
Open Source Interest	63	4	1				1	2	1	3	14	9	8.65	10

(Library Technology Guides:2020.)

(Symphony)

-user installation: Symphony has been installed in 3,486 libraries, spanning 12,437 facilities or branches)

-implementations by Type of Library

Distribution of 3486 Symphony implementations by Type

- Academic (479) — 13.7%
- Public (2024) — 58.1%
- School (604) — 17.3%
- Special (72)
- Other (307) — 8.8%
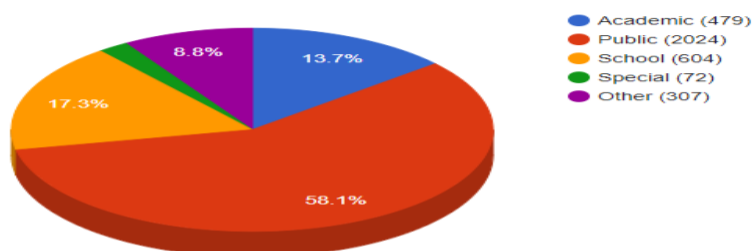
Type	Libraries	Facilities
Public	2024	6838
Academic	479	731
Special	72	96
School	604	4346
Others	307	
Total	3486	12437

(Library Technology Guides:2020.)

Mount Attaka, Galala City, Suez Governorate. Egypt
@ Info@gu.edu.eg
🌐 www.gu.edu.eg

-System migration patterns

Previous systems used by the 3486 libraries migrating to Symphony (counting number of institutions)

Legend:
- Spydus (29)
- Circulation Plus (27)
- Sierra (24)
- Bookmark Library Management System (20)
- Library Management Cloud (20)
- PLUS (19)
- Taos (18)
- Athena (17)
- Locally developed (14)
- Destiny (13)
- VTLS (12)
- Koha -- LibLime (11)
- Mandarin M3 (11)
- Vubis Smart (11)
- Voyager (11)

▲ 2/4 ▼

Pie chart labels: MultiLIS (586), DRA (386), Dynix (374)
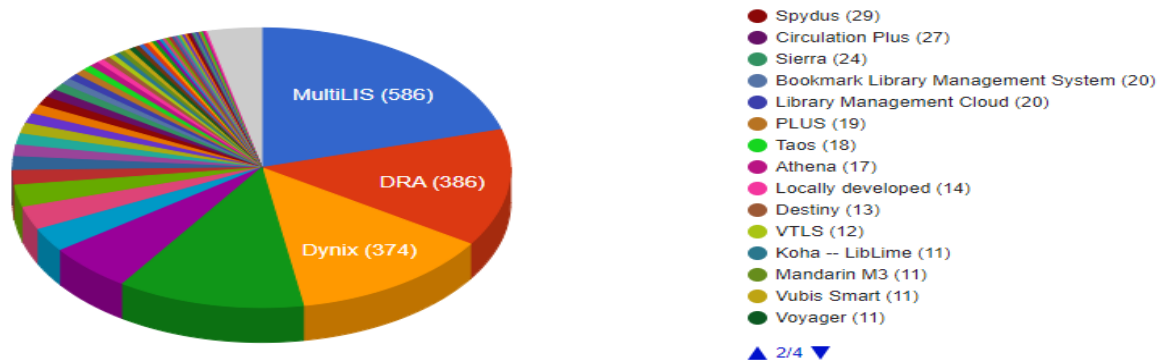
(Library Technology Guides:2020.)

- Satisfaction Ratings

Statistical Report for Symphony

2022 Survey Results														
Product: Symphony		**Response Distribution**										**Statistics**		
Category	**Responses**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Mode**	**Mean**	**Median**
ILS Satisfaction	97	1	1	3	2	5	2	12	29	30	12	8	6.87	7
ILS Functionality	97			2	2	6	5	10	29	29	14	7	7.01	7
Print Functionality	97			1	2	1	4	2	30	37	20	8	7.53	8
Electronic Functionality	97	3	2	4	1	11	15	13	16	18	14	8	6.10	6
Company Satisfaction	95			1	3	5	4	8	23	27	24	8	7.28	8
Support Satisfaction	97		1	1	1	1	2	5	23	26	37	9	7.75	8
Support Improvement	0											0	0.00	
Company Loyalty	94	10	1	1	5	3	5	6	16	22	25	9	6.43	8
Open Source Interest	92	15	10	10	7	5	17	3	8	6	7	5	4.14	4

(Library Technology Guides:2020.)

Open-source system for the library (koha-dspace)

In this part, I will explain the history of the systems and what is this system's ability of giving services for the library team or the users.

(Koha)

-HISTORY:

Briefly koha was created in 1999 through a contract implemented by Katipo Communications for a three-branch library system in New Zealand called Horowhenua Library Trust (HLT). Relational data; Perl, for programming business logic and interfaces; Linux operating system and Apache web server **(Breeding, 2014).**

-SERVICES:

Before we speak about the service, we have to note that system have two view back view and front view in koha we called it staff portal and opac portal

First staff portal:

1- The library team which Divided into two kinds of user admin for the system and librarians,

For the admin, all system help him to administer the system but when we speak about the open source software there are other advanced features that help him when we speak about koha I will speak about the important feature that helps admin,

-Online public access catalog (OPAC): a bibliographic record of a library's holdings, available in machine-readable form *("Definition of Online Catalog," n.d.)*

Mount Attaka, Galala City,
Suez Governorate. Egypt
@ Info@gu.edu.eg
⊕ www.gu.edu.eg

FIGURE 1 IN APPEARANCE FROM OPAC PREFERENCES FIGURE YOU CAN FIND THAT WE CAN CHANGE IN OPAC OF THE SYSTEM VERY EASY ONLY WANT TO DO THAT FROM **HTML** LANGUAGE AND THIS LANGUAGE IS VERY EASY TO FORM THIS OPEN SOURCE I CAN PUT TEXT OR VIDEO OR CREATE NEW PAGES VERY EASY THIS SO DIFFICULT IN THE CLOSE SOURCE YOU HAVE TO RETURN TO THE COMPANY YOU GET FROM THEM THE SYSTEM.
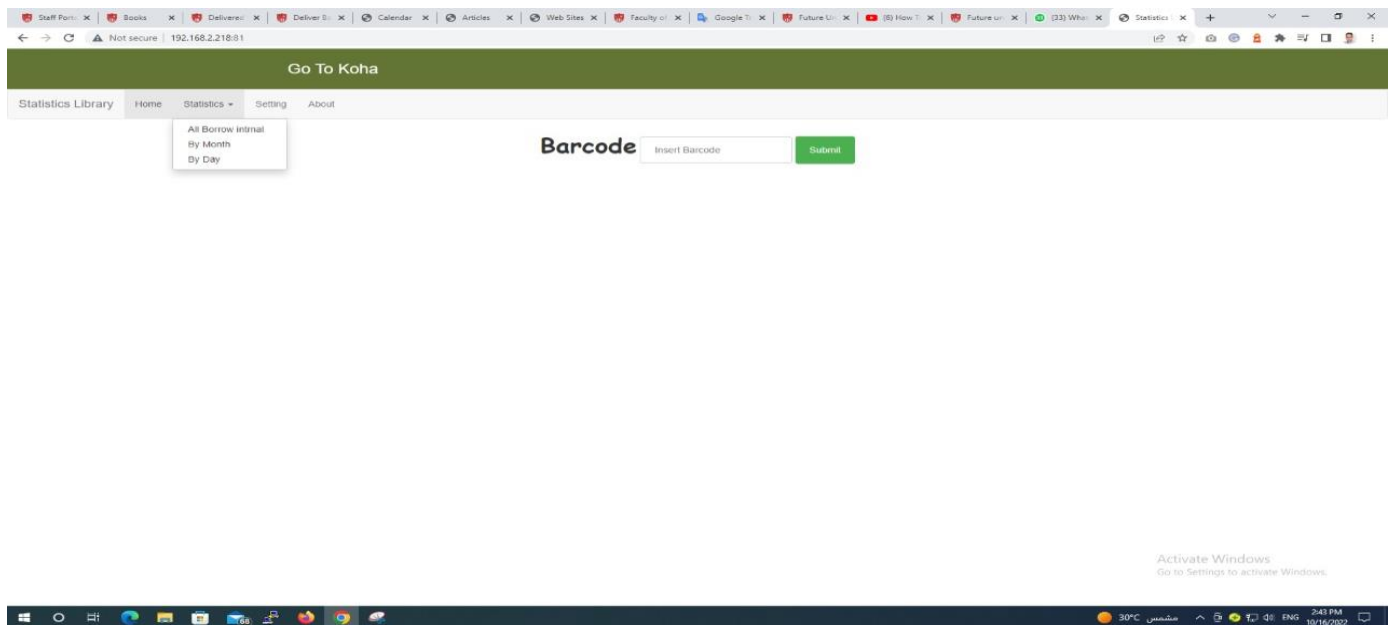
-Modules (development):

FIGURE 2 IN FIGURE YOU CAN FIND THAT WE CAN DEVELOP THE SYSTEM BY INSERTING NEW MODULES NOT IN THE SYSTEM LIKE "STATISTICS FOR BOOK USE "AND ANY MODULES THAT BECAUSE THE SYSTEM USES PERL LANGUAGE IS NOT COMPLICATED LANGUAGE EASY THIS SO DIFFICULT IN THE CLOSE SOURCE YOU HAVE TO RETURN TO THE COMPANY YOU GET FROM THEM THE SYSTEM.

- language: you can insert more than 25 languages to make staff and OPAC translate to this language and this problem was a big problem specific in the mean region because the Arabic language and in the closed source take a big effort and time to do but when the problem appears all developers in many countries try to solve it and solve it in 2010 and development more and more to 2016 it is a perfect way and do this in the system by this link: https://wiki.koha-community.org/wiki/Correcting_Search_of_Arabic_records.

And we can put multiple languages in system very easy with the instructor in this link:

http://kohageek.blogspot.com/2013/05/how-to-add-new-language-translation.html#comment-form.

-Catalog (update) : in this part, I mean that the koha system is more flexible in keeping up any updates in cataloging standards like RDA we can change 50% of the RDA standard in every catalog record with very easy without taking time from more than one way for example from the system in MARC modification templates we can make a template to transfer data from the field to another like 260 to 264 and else field or export data out of the system and use application marc edit and change data and return to the system.

For the librarians:

-Cataloging:

Mount Attaka, Galala City, Suez Governorate. Egypt
Info@gu.edu.eg
www.gu.edu.eg

Leader (NR)

MARC 21 Bibliographic - Full	November 2016

Indicators and Subfield Codes
Has no indicators or subfield codes; the data elements are positionally defined.

Character Positions
00-04 - Record length

05 - Record status

a - Increase in encoding level

c - Corrected or revised

d - Deleted

n - New

p - Increase in encoding level from prepublication

06 - Type of record

a - Language material

c - Notated music

d - Manuscript notated music

e - Cartographic material

f - Manuscript cartographic material

g - Projected medium

i - Nonmusical sound recording

j - Musical sound recording

k - Two-dimensional nonprojectable graphic

m - Computer file

o - Kit

p - Mixed materials

r - Three-dimensional artifact or naturally occurring object

t - Manuscript language material

07 - Bibliographic level

a - Monographic component part

b - Serial component part

c - Collection

d - Subunit

i - Integrating resource

m - Monograph/Item

s - Serial

08 - Type of control

- No specified type

a - Archival

09 - Character coding scheme

- MARC-8

a - UCS/Unicode

FIGURE4 HELP LIBRIAN FOR CATALOGE

--Report: koha use SQL language to create the report so the koha community help user creates many reports by putting in the link to help user to take this report copy and paste to report for creating so Which mean you can easily create a report without know SQL language, in the close system the company who create report for the user *(SQL Reports Library - Koha Wiki, n.d.)*.

Second opac portal:

As we speak and explain the back view or admin view, we will find that all features and updated help for the front view so we can separate the services for the admin and user.
It is the front view for all users, not the library team only but all users in this academic can use this site
I will speak about the services and features in koha as open sources.
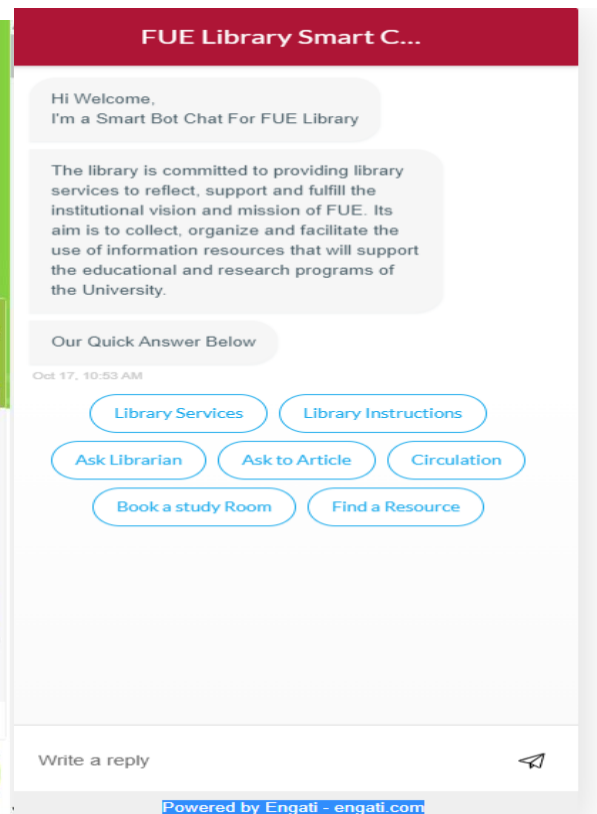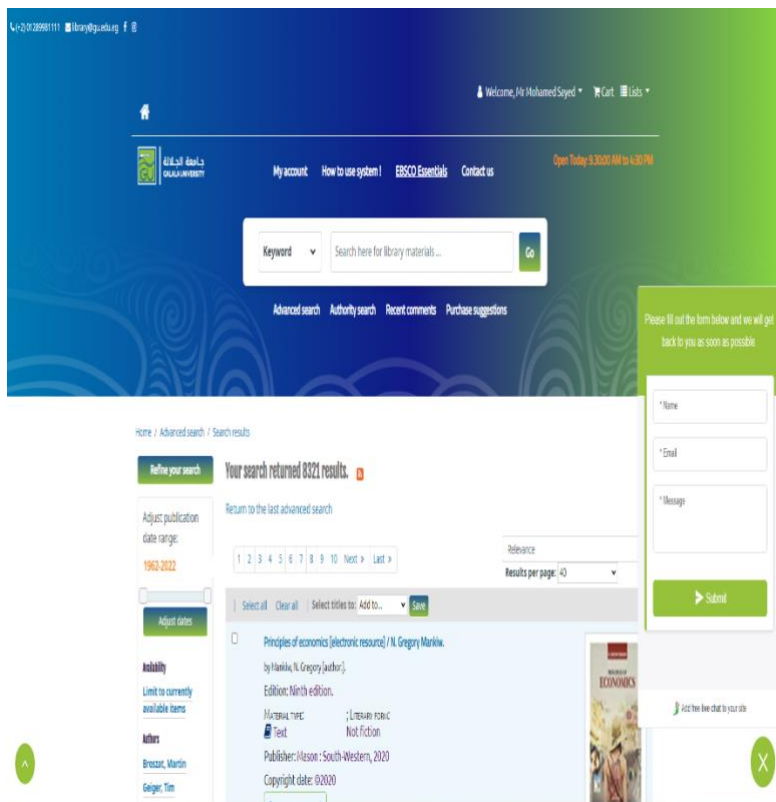
- Chatbot:

FIGURE 5&6 IN FIGURES YOU CAN FIND THAT WE CAN THAT THERE ARE MANY DIFFERENT APPLICATIONS CAN HELP USER TO CONNECT TO THE LIBRARY TEAM WITH A TWO-WAY CHAT BOX NORMAL OR A SMART CHAT BOX.
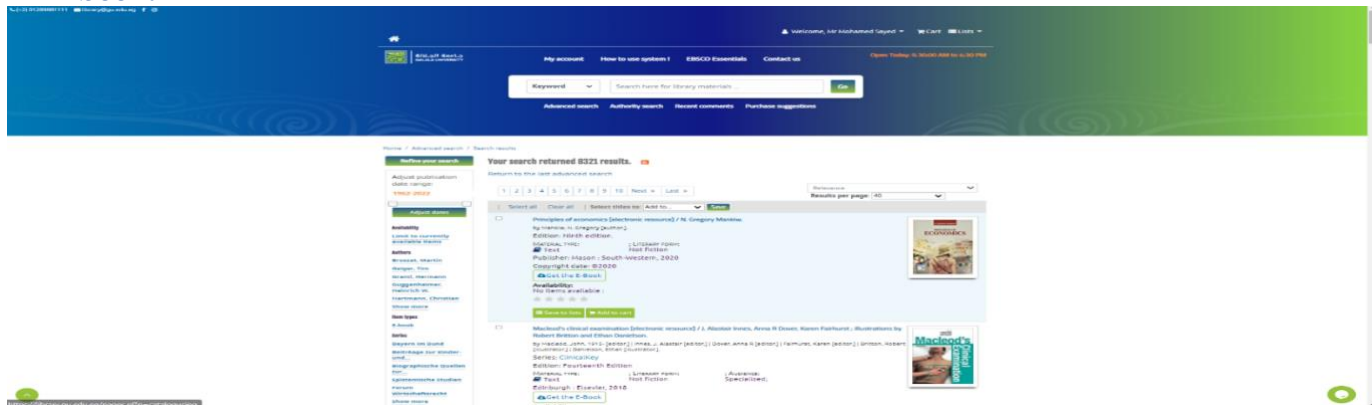
- E-book:

FIGURE 4 IN FIGURE YOU CAN FIND THAT USERS CAN USE THE LIBRARY SITE AS THE ELECTRONIC LIBRARY YOU WILL FIND ELECTRONIC BOOKS OR VIDEOS OR LINKS.
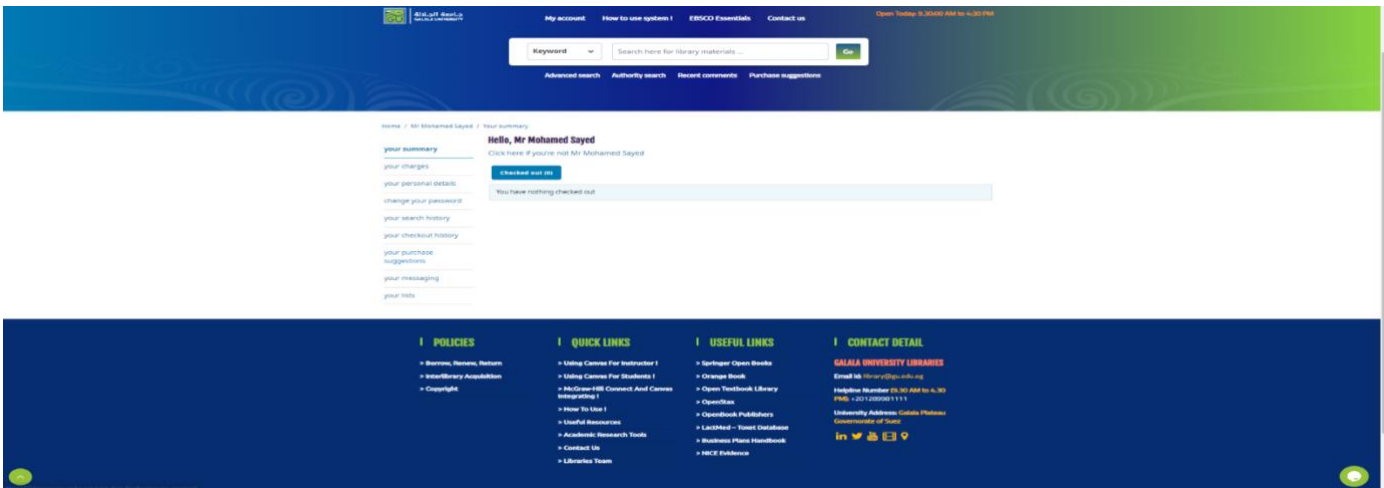
-My account:

FIGURE 5 IN FIGURE YOU CAN FIND THAT USERS CAN SEE AVERY THING ABOUT HIS DATA AND CAN CHANGE IT AND CAN SEE THE SEARCH HISTORY AND CHECK OUT HISTORY AND GIVE TO THE LIBRARY TEAM PURCHASE SUGGESTIONS.
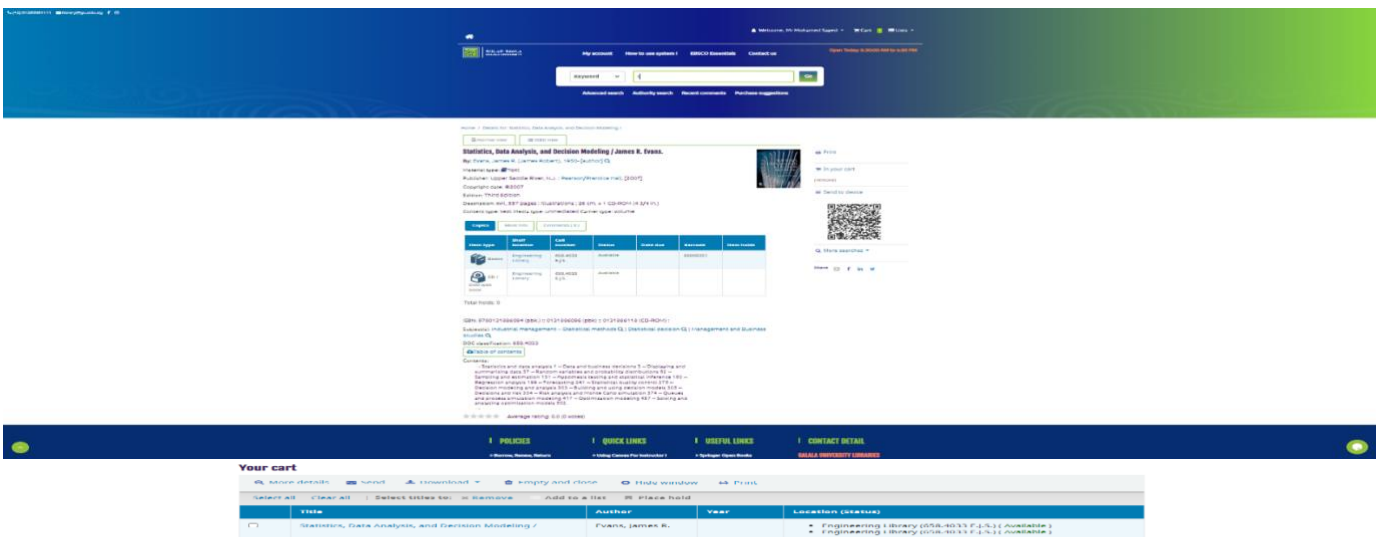
-Data record:

FIGURE 6 IN FIGURES YOU CAN FIND THAT USERS CAN SEE THE ALL DATA OF THE RECORD IN THE NORMAL WAY AND THEY CAN HOLD THIS BOOK ELECTRONIC TO TAKE HIM FOR CIRCULATION ONLINE AND CAN TAKE THIS DATA WITH THE QRCODE TO SAVE IT IN MY PHONE OR TO SEND THIS DATA TO ANOTHER USER, USER CAN SEND THIS DATA TO HIS CART AND COLLECTED HIS LIST AND FROM THE CART CAN DOWNLOAD THIS LIST.

`

Mount Attaka, Galala City,
Suez Governorate. Egypt
@ Info@gu.edu.eg
⊕ www.gu.edu.eg

(Dspace)

-HISTORY:

DSpace is a web application, allowing researchers and scholars to publish documents and data. While DSpace shares some feature overlap with content management systems and document management systems, the DSpace repository software serves a specific need as a digital archives system, focused on the long-term storage, access and preservation of digital content thus making DSpace the software of choice for academic, non-profit, and commercial organizations building open digital repositories. It is free and easy to install "out of the box" and completely customizable to fit the needs of any organization *(https://dspace.lyrasis.org/about/).*

As I mentioned in the definition that DSpace is a digital repository for the institutions so we can use this software for all data in the academic institutions for example the University's intellectual and research products for the professor and the academic staff, and the student projects, now I will some of services and features in this system.

* Notice: Total Known Installations 3,051 all around the world

(https://dspace.lyrasis.org/annual-report/)

-SERVICES: 1- Completely customizable to fit user needs: that means we can use this system for many appearances for example in the figure we can create a community and sub-community with all data we want to put in this community like the faculty of medicine is a community, articles are sub-community, and all articles' data will be in this sub-community.
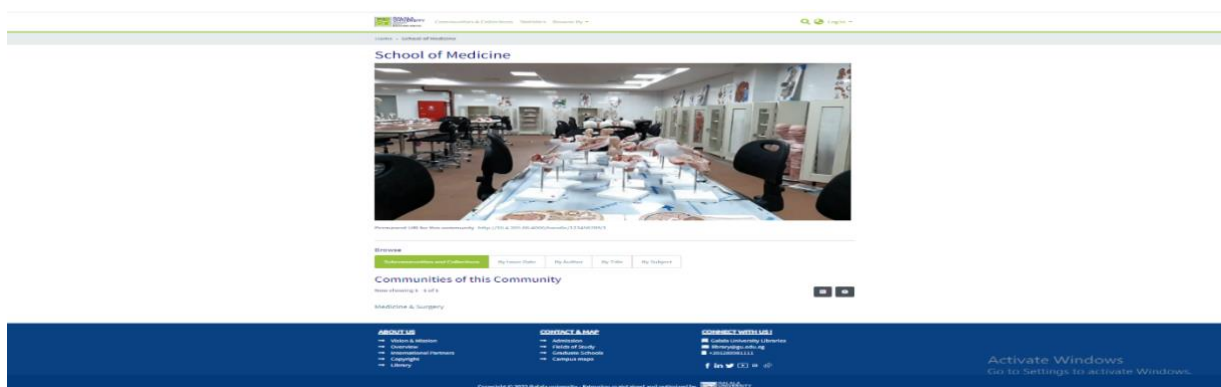*(*https://dspace.lyrasis.org/features/*)*

FIGURE 7 COMMUNITY IN DSPACE

Mount Attaka, Galala City,
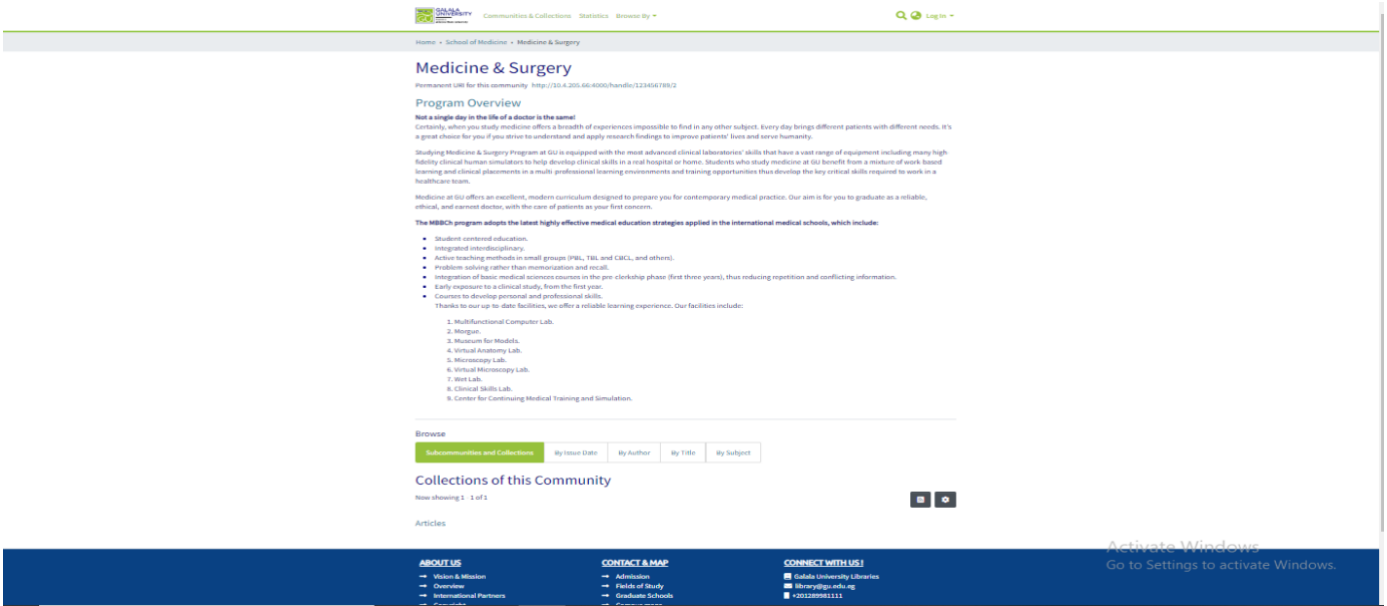Suez Governorate. Egypt
@ Info@gu.edu.eg
www.gu.edu.eg

FIGURE 8 SUB COMMUNITY IN DSPACE

2-Manage and preserve all format of digital content (PDF, Word, JPEG, MPEG, TIFF files): that mean we can put all format in system without no problem *(https://dspace.lyrasis.org/features/)*

3-Interface available in 22 languages: in this site we will found that dspace is support Arabic language in interface we can se this in this link " https://repo-nu.maktabat-online.com/home"
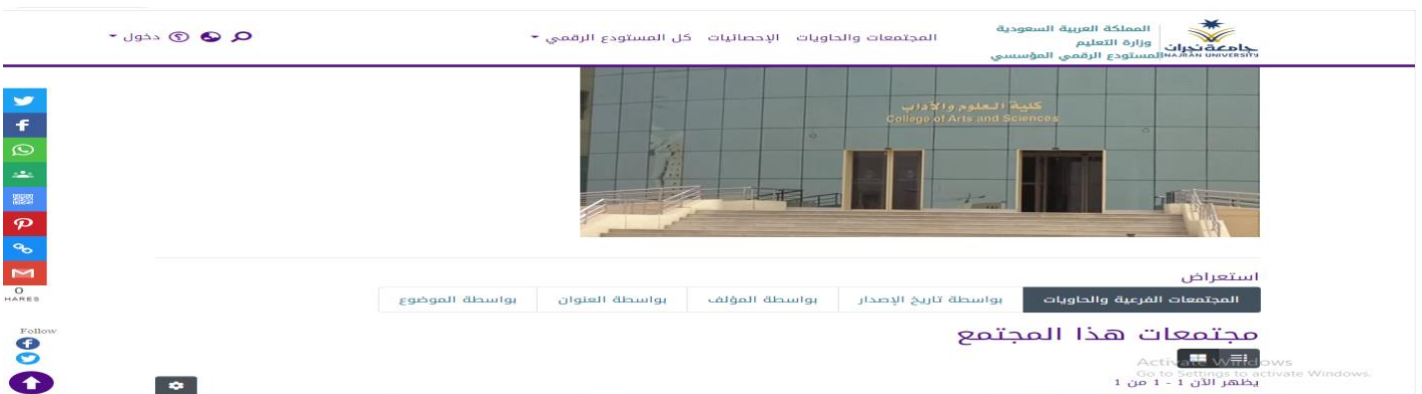

FIGURE 9ARABIC LANGUAGE IN DSPACE

4-Optimized for Google Scholar indexing: that mean we can relate this system and Google scholar for indexing (https://dspace.lyrasis.org/features/*)*

5- ORCID Integration with dspace: in this figure we can see that in Galala university we integration with orcid id for the academic staff.
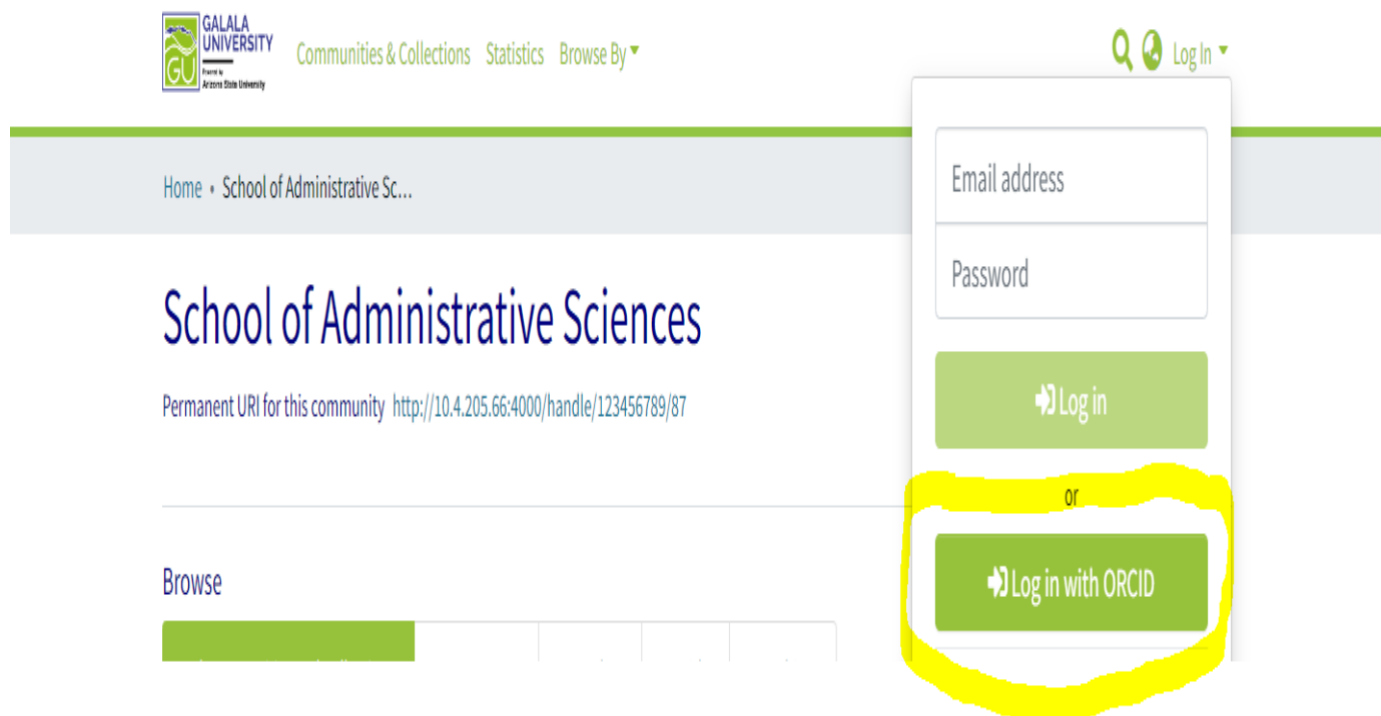

FIGURE 10 ORCID INTEGRATION WITH DSPACE

Conclusion

In this paper I explain the difference between the open source and closed sources and give example of this system in an academic library, the following results were obtained:

1- Open-source software is best way for the academic library because of cost and support and use.
2- Based on the statistics in the paper, I believe that open-source systems will be the future of systems in all fields in 5 or 10 years, depending on human resource technology development.

Mount Attaka, Galala City,
Suez Governorate. Egypt
@ Info@gu.edu.eg
🌐 www.gu.edu.eg

References

1- Kavanagh, P. (2004, August 9). Open-Source Software: Implementation and Management (Software Development) (1st ed.). Digital Press.

2- Lile, W. (2015, May 4). Open and Closed Source System Comparison. Wendy Lile - Academia.edu. Retrieved October 23, 2022, from https://www.academia.edu/12230230/Open_and_Closed_Source_System_Comparison

3- Clarke, Russell. Is Open-Source Software More Secure?

4- Breeding, M. (2014, April 1). The History and Background of Koha. Library Technology Guides. Retrieved October 23, 2022, from https://librarytechnology.org/document/19403

5- Library Technology Guides: Koha -- Bywater Solutions Profile. (n.d.). Retrieved October 23, 2022, from https://librarytechnology.org/product/koha-bywater

6- Library Technology Guides: Symphony Profile. (n.d.). Retrieved October 23, 2022, from https://librarytechnology.org/product/symphony/

7- Definition of online catalog. (n.d.). In www.dictionary.com. Retrieved October 23, 2022, from https://www.dictionary.com/browse/online-catalog

8- SQL Reports Library - Koha Wiki. (n.d.). Retrieved October 23, 2022, from https://wiki.koha-community.org/wiki/SQL_Reports_Library

9- Mitchell, S. (2022b, March 11). About. DSpace. Retrieved October 23, 2022, from https://dspace.lyrasis.org/about/

10-   Mitchell, S. (2022a, March 9). Annual Report. DSpace. Retrieved October 23, 2022, from https://dspace.lyrasis.org/annual-report/

11-   Mitchell, S. (2022d, March 16). Features. DSpace. Retrieved October 23, 2022, from https://dspace.lyrasis.org/features/