

The Contribution of Integrated Automated Systems to Promoting Open Access, Valuing Scientific Research Outputs, and Consolidating its Ethics in Algerian University Libraries: A Case Study of the Central Library at the University of Oran 1 Ahmed Ben Bella

Dr. Wahiba Haouari ¹, Dr. BOUZARA Ahlem ²

¹ Libraries and Information Centers.

¹ Libraries and Information Centers , University of Oran 1 – Ahmed Ben Bella.Algeria

Email: haouari.wahiba@univ-oran1.dz

² Associate Professor Class A, Library and Information Science

² Department of Humanities , Faculty of Humanities and Social Sciences, University of Djillali

Liabes University of Sidi Bel Abbès, Algeria

Email: ahlem.bouzara@univ-sba.dz

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Abstract:

This study aims to analyze the role of integrated automated systems in supporting open access to scientific output, maximizing the value of research outcomes, and fostering ethical scientific practices within Algerian university libraries, using the Central Library of the University of Oran 1 (Ahmed Ben Bella) as a case study. The study focuses on the utilization of library automation, institutional repositories, and digital access and retrieval tools to enhance the visibility of scientific output, optimize its utilization, and embed principles of academic integrity. It highlights the importance of integrating digital infrastructure, scientific information governance, and open-access policies in developing university library services and supporting the research environment.

Keywords: Integrated automated systems; Open access; Scientific output; Institutional repositories; Library automation; Information governance; Academic integrity.

Introduction:

The scientific research is considered the basis instance for the academic institutions development, in any field of study fields that encompasses, and in the various scientific disciplines, particularly medical, natural, applied, and mathematical sciences...etc. University libraries at the level of these institutions have achieved high grades of excellence and leadership in determined fields of scientific research. Yet, it seeks to maintain this excellence by valuing it so that mutual benefit is achieved between university education and scientific research. The appreciation of scientific research is not a new issue although the scientific work and technical work have long maintained the appearance of an independent existence, the convergence between them has been gradual over time. The scientific researchers through the automated systems for managing open source libraries about the system's ability to provide cost-effective, flexible, and accessible solutions for organizing and disseminating academic knowledge.

Ideally, these systems enable libraries to better support academic communities, encourage research collaboration, and foster more open and inclusive academic environments. Therefore, the following problem arises as the following: What is the role the automated integrated systems for managing

university libraries in promoting scientific research and its ethics through open access in Algerian university libraries?

The goals of study:

This study aims to the following points:

- Recognizing the automated systems with open access available in the central university libraries in Algeria, particularly in the University Library of Oran 01.
- Presenting the central university library Oran 01 as model in for valuing research and ensuring its ethics.
- Recognizing the extent contribution of open access systems in ensuring the ethics of scientific research.
- Recognizing the extent contribution of open access systems in valuation scientific research.

The methodology adopted in this study:

The study focused on the analytical descriptive approach that is considered an appropriate to describe and analyze the reality of the use of integrated automated systems at university libraries, and revealing their role in promoting open access, valuing the outputs of scientific research and consolidating its ethics.

1.The concept of valuing scientific research:

- 1.1. What does the word valuation mean: In Arabic, the word (tathmeen) “valuation” refers to a verbal noun derived from "thaman", meaning the price of something, i.e., determining its value.¹
- 1.2. The concept of the valuation process: It is the means, mechanism, and method we follow in determining the value of something.
- 1.3. Scientific research: Scientific research is a mean of study, through it, various problems can be solved by comprehensive and accurate investigation of all phenomena and variables related to the research problem.²

Scientific research is an objective process of collecting and analyzing data in order to reach conclusions.³

- 1.4. Valorization of Research: Research valorization is a simple process that allows for maximizing the impact of scientific research results and ensuring their benefit to society, the economy, and culture.⁴
- 1.5. Valorization of scientific research: The common meaning of the term, according to Larousse, “is to value something, or to make it acquire value, or even to give increased importance to something, or to highlight it.”

Valorization, according to this same dictionary, is defined as "the act of assigning value, of adding more value to something or someone, to the fact that it is appreciated." Here, highlighting means to

¹ <https://qamus.inoor.ir> Dictionary al-Noor

² Muhammad Azhar Saeed Al-Zattak, Scientific Research Methods: Foundations and Applications, Amman: Dar Al-Yazouri for Publishing and Distribution, 2008, p. 20.

³ Asaad Hassan Atwan, Youssef Khalil Matar, Scientific Research Methods, Beirut: Dar Al-Kutub Al-Ilmiya, 2018, p. 14

⁴ Blandine Laperche, The organic square of research valorization The case of a young university in a context of crisis, Higher education policies and management 2002/3 no 14,p 172-173 file:///C:/Users/DELL/Downloads/le-carre-organique-de-la-valorisation-de-la-recherche.pdf .

emphasize, publicize, and give more importance, but also to assign more value, without specifying in what unit this value can be measured.⁵

- The valorization is like a tidal wave, for publishing, but then... we are entering a new era, and we can feel its arrival... what impact we are having, and not just in academic journals.⁶
- The valorization is considered as a field of grounding symbolic cultural resources that would play a pivotal role in shaping the concerns of societies and giving importance to their endeavors.⁷
 - Valuing research involves making findings, knowledge, and skills usable or marketable. Therefore, a valuing policy requires appropriate tools and structures.⁸
 - Valuing scientific research in general means adding value and providing a stable entity, and artificially increasing the market value of scientific research results.⁹

2. The concept of integrated automated systems in open-source libraries:

- Integrated automated systems are now among the most important pillars of libraries and greatly help in performing their tasks. Therefore, libraries today must take great care in choosing the automated system before purchasing it, in accordance with the standards and principles established by specialists, in order to make full use of these systems.¹⁰
- The integrated automated system is a complete set of computer programs that enables numerous library operations. It is well-known that the activities of these institutions encompass a range of processes such as acquisitions, cataloging, classification, information services, lending, reference services, and others, and it also provides full online access to meet users' needs for information resources in a timely manner, in the appropriate quantity, and in the appropriate format.¹¹
- The integrated automated library system consists of a set of functional modules such as: circulation, acquisition, cataloging, periodical tracking, and the online public access catalog (OPAC). The term integration refers to the system that performs all library functions automatically based on a single bibliographic file.¹²

3. Objectives of open-source integrated automated systems at university libraries.

Open-source integrated automated systems in university libraries have contributed to the development and standardization processes that are performed at libraries. Among the most prominent processes to which automated systems have been applied are the following:

⁵ <file:///C:/Users/DELL/Downloads/le-carre-organique-de-la-valorisation-de-la-recherche.pdf>

⁶ Isabelle Collin-Lachaud, Géraldine Michel. Promoting research: a new mission for teacher-researchers? Marketing Decisions No. 97 January-March 2020, pp. 14-15. <file:///C:/Users/DELL/Downloads/valoriser-la-recherche-une-nouvelle-mission-des-enseignants-chercheurs.pdf>

⁷ Salvatore Giuffrida, Maria Rosa Trovato, Paolo Rosato *Science of Valuations: Natural Structures, Technological infrastructures, cultural superstructures*

⁸ Henri Duranton, Raymond Legeais and Maurice Maurin, The Valorization of Research, pp. 9-10 on <https://www.vie-publique.fr/files/rapport/pdf/044000325.pdf>.

⁹ Liliana Doganova, Valoriser la science: Les partenariats des start-up technologique, paris : presses des Mines, 2012, p20-21.

¹⁰ Rajab Abdel Hamid Hassan, Change Management in Library Institutions, [n.p.]: Al-Arabi Publishing and Distribution, 2021, p. 161.

¹¹ Sayeda Majid Muhammad Rabie, The Modern Foundations of Libraries, Alexandria: Dar Al-Thaqafa Al-Ilmiya, 2012, pp. 203-204.

¹² Ehab Saeed Ragab, Mona Abdel Aziz Abdel Ghaffar, Automated Systems in Libraries: From Computing to Digitization, Alexandria: Dar Al Wafaa for Publishing and Distribution, 2025, p. 90.

1. Preparing cataloging.
2. Linking the bibliographic databases particularly to the circulation system.
3. Automating the acquisition, purchase, return, delivery, and tracking of periodicals.
4. Electronic processing of services.
5. Current awareness and selective dissemination of information.
6. Providing internet-based software and programs for electronic media, word processing, and electronic data.¹³

4. What should be available in open-source integrated automated systems at university libraries.

1. In the Indexing Sector: The ability to select, transfer, create, modify, print, and search all bibliographic records.
2. In the Beneficiaries File: The beneficiaries file must include: a unique number, name, address, contact information, fees and fines imposed, details of loaned/seized materials, and the beneficiary's registration expiry date.
3. In the supply sector: Responding to all inquiries related to tracking required materials, including preparing, sending, and canceling purchase orders. Direct communication with suppliers, ensuring supplier data is maintained, including purchase invoice data and required material details. The system should allow printing any previous data, retrieving supply records for any field or data element, and monitoring the preparation of periodic reports.¹⁴

5. Requirements for open-source integrated automated systems used at university libraries.

For automated systems to achieve their intended goals, the necessary resources must be provided for the integrated automated systems used in libraries and information centers.

1. Human Resources: These include software designers, programmers, data entry, coding, data entry, security, computer operation, and information system management.
2. Material Resources: These include equipment and tools, such as physical devices and materials used in data processing, computer systems, and peripherals like keyboards, mice, monitors, etc.
3. Software Supplies and Their Applications: This refers to the software used by computers within a database and is divided into:
 - Application Software: This includes full-view and special-view software.¹⁵
 - System Software: The term system software refers to the operating systems, utilities, and middleware that are essential components of the IT infrastructure. These components enable the operation of applications, the monitoring and optimization of system software performance, and the resolution of potential and actual service problems.¹⁶

6.Types of Integrated Automated Library Management Systems Available via the Internet

There are various types of computer programs are available via the internet, each differs in its purpose within terms of advertising, evaluation, usage measurement, etc. They are obtained for free. The following are the types of programs available via the internet.

¹³ Mrs Wahiba Gharrami, Modern Library Management, Algeria: University Publications Office, 2010, p. 189.

¹⁴ Wahiba Gharrami, Modern Library Management, Algeria: University Publications Office, 2010, p. 189.

¹⁵ Abdul Nasser Alak Hafez Hassan and others, Management Information Systems with a focus on organizational functions, Amman: Ghaydaa Publishing and Distribution House, 2014, p. 39.

¹⁶ *Models of integrated, On website: <https://sfia-online.org/ar/sfia-8/skills/system-software>. Viewed On(06/10/2021).*

1. Shared software, owned by the bank or any of its affiliated companies, transferred and used in business.
2. Free software.
3. Experimental software.
4. Completed and incomplete software.
5. Public domain software.
6. Software packages.
7. Conditional copyright software.
8. Commercial software.
9. Open-source software.
10. Free software.¹⁷

7. The sixth requirement: Models of integrated automated systems used at the central university libraries of Oran 01, which are open source.

7.1. Section 1: The PMB (PHP Library Management System)

The company PMB Services is founded in 2004, aims to publish and develop PMB library management systems, a 100% free tool for managing reference documents. It also offers personalized services to libraries and documentation centers to enhance their use of the software.

PMB Services also provides a comprehensive, multifunctional solution for managing digital and paper documents, offering a global project for document management. This integrated solution is designed for identifying, utilizing, promoting, and disseminating information. PMB is free software, meaning everyone is free to: run the software; study the software by accessing its source code; modify the software; and redistribute the software, whether modified or not.¹⁸

PMB is a 100% free, flexible, and feature-rich software—a true reference tool. It is adapted to the needs of public reading institutions, specialized libraries, documentation centers, and higher education and research institutions. Thanks to its particularly effective and innovative developments, PMB can also provide relevant solutions for any organization with a global knowledge management project. The PMB software is continuously developed by the PMB Service Innovation Team and is constantly evolving. A new stable version of the software is delivered annually.

Key PMB Releases: Version 7.4 of PMB is available. Version 7.3 and Version 5.0 are also available.¹⁹

7.1.1. The core functions of the PMB system:

PMB software is 100% free and is a fully modular, integrated library management system. Its functions perfectly fulfil the needs of librarians, librarians, and information managers, regardless of the size or type of their organization. The key features can be summarized as follows:

1. Easy to use.
2. PMB works to improve document collection.
3. Managing the physical and the digital assets.
4. Unifying Document collection
5. Native integration of solutions.

¹⁷ Amr Hassan Fatouh Hassan, Open Source Software for Building and Managing Digital Libraries: Foundations, Selection and Evaluation, Riyadh: King Fahd National Library, 2012, p. 161.

¹⁸ PMB Services .On Website https://www.sigb.net/index.php?lvl=cmspage&pageid=12&id_rubrique=37&opac_view=1. Viewed On (02/10/2022).

¹⁹ PMB. On Website www.sigb.net/index.php?lvl=cmspage&pageid=6&id_rubrique=194 Viewed On (02/11/2022).

6. Assessing the fund through a personal document gateway RFID.
7. Acquisition management.
8. Activity monitoring using powerful statistical tools.
9. User communication (DSI).
10. Document product monitoring.
11. Internal user management or synchronization with LDAP/AD catalog.²⁰

The distribution of different disciplines through the Library Management System (PMB) at the Central Library of Oran 01 Ahmed Ben Bella for the year 2025-2026 is represented by the following table:

Service of Medicine	Service of Applied Sciences	Service of History and Islamic Law	Service of Languages,	Service of Periodicals	Service of Social Sciences,	Service of Humanities
	10233	8166	7845	4689	7892	8756

7.2. Section 2: The digital repository Dspace.

7.2.1. The Dspace Digital Repository Concept

Dspace is an open-source software package specifically designed for managing digital repositories. It is used to create open access repositories for distributing academic or institutional digital content. Similar to content management systems (CMS) and document management systems (MDS), Dspace offers a suite of services as a digital archive management system, focusing on long-term storage, availability, and preservation of digital content.

It also focuses on delivering digital content to end users and provides a complete set of content management tools.

Dspace is the most widely used option for building digital repositories for academic institutions due to its adaptable structure, which can be modified to meet future user needs. The software helps create, index, and retrieve all forms of digital content. It boasts high compatibility with most operating systems and adheres to international metadata standards.²¹

Dspace is an open-source platform available free of charge to anyone and can be easily downloaded under an open-source license.

This means that any organization can use it, modify it as needed, and even integrate the code into commercial applications without paying licensing fees. Naturally, its source code is modifiable, making it more user-friendly than other programs that lack such flexibility and are sometimes referred to as proprietary software.

Over 100 contributors worldwide participate in the development process. The Dspace program is managed by a small group of volunteer developers (called the Dspace Committee) who work together to develop a plan that includes integrating new features and fixes and delivering them to the user base.²²

²⁰ Syngeb, On Website https://www.sigb.net/index.php?lvl=cmsspage&pageid=6&id_rubrique=147 Viewed On (07/01/2022).

²¹ <https://youlem.wordpress.com/2017/03/09/dspace/>.

²² <https://blog.naseej.com/2013/07/21/dspace-open-source-software>.

**7.2.2. Results of the digital repository at the Central Library of the University of Oran 01
Ahmed Ben Bella:**

	Specialization	Doctorate in “Foreign Language”	Doctorate in “Arabic Language”	Master degree in “Foreign Language”	Master degree in “Arabic Language”	Total
Faculty of Medicine	Department of Dental Surgery	19				19
	Department of Medicine	241				241
	Department of Pharmacy	08				08
Faculty of Art and Literature	Department of Arabic Language and Literature		358			749
	Department of Arts		83			
Faculty of natural and life sciences	Department of Biotechnology	64		35		139
	Department of Biological Sciences	351	03	62		
Faculty of Applied Sciences	Computer Science Department	206				341
	Department of Chemistry	195				376
	Department of Mathematics	118				188
	Department of Physics	89				208
Faculty of Islamic Sciences	Department of Fundamentals of Religion					
	Department of Islamic Civilization					
	Department of Islamic Sciences					
	Department of History and Archaeology					

Faculty of Humanities	Department of Library and Information Science					
	Department of Media and Communication Sciences					
Translation Institute	Translation Institute	01	93			216
Institute of Applied Sciences and Technologies (ISTA)	Institute of Applied Sciences and Technologies (ISTA)			09		
Total		1295	979	106	106	4148

7.2.3. Advantages of Open Source Software:

1. Community Support: One of the biggest advantages of open-source software in which it is the support of the developer community. This means that when problems arise, there is a group of people who can help to solve them, and users can contribute to the software's development by submitting bug reports, patches, and feature requests.
2. Transparency: Due to the source code is open, it's possible to see exactly how the software works. This means it's easier to discover security vulnerabilities, and users can be sure there are no hidden backdoors or other malicious code.
3. Cost: Open-source software is often free or available at a much lower cost than closed-source software. This means it's accessible to a wider range of users and can be a cost-effective solution for businesses and organizations.²³

7.2.4. Disadvantages of Open Source Software:

Although open-source software has advantages, which have already been discussed, it also has some disadvantages, which can be summarized as follows:

1. The work environment is often overlooked in favor of performance, making it difficult for less qualified individuals to get started.
2. The formation is not clearly defined. In fact, adapting free software to individual needs is often very complex, and the configuration options are numerous and often incomprehensible to the general public.
3. Due to the multitude of versions, we often encounter confusion when choosing a version or distribution (Linux), and many communities have different approaches.
4. Device drivers are generally available later, creating a skills gap between IT administrators responsible for maintenance.

²³ Open source vs. closed source: Pros and cons. On Website:

<https://blog.ossph.org/open-source-vs-closed-source-pros-and-cons/>. Viewed On(07/11/2022).

5. The availability of source code also makes it accessible to virus creators, resulting in reduced or no safeguards.²⁴

8. Reasons for Adopting Open Source Software:

Researchers Kesson and Ryan identified several policy-based reasons for adopting open source—particularly the perceived high value proposition of open source (compared to most forms of proprietary software)—categorized as follows:

1. Safety
2. Affordability
3. Transparency
4. Vortex
5. Interoperability
6. Flexibility²⁵

9. Valuing Scientific Research and its Ethics through Automated Library Management Systems in Open-Source University Libraries:

Open-source library management systems play a significant role in promoting research ethics by providing platforms for knowledge exchange, enhancing transparency, and ensuring free access to academic content. Using these systems can improve academic ethics and enhance the value of scientific research, contributing to building a fair and responsible scientific environment. Here's how this can be achieved:

1. Promoting unrestricted open access to all research: Through open publishing via systems like PMB or Dispace, research becomes available to everyone without financial constraints. This enhances transparency and allows researchers worldwide to access research findings.
2. Fostering the exchange and collaboration of scientific knowledge: This promotes collaboration and allows researchers worldwide to access research findings.
3. Eliminating information bias through open access, thereby promoting the principle of information fairness and equality, ensuring that all stakeholders can benefit from research findings without exception.
4. Combating data and scientific findings forgery through open access via repositories.
5. Publishing data with historical documentation enhances the credibility of scientific research and promotes transparency, preventing manipulation of results.
6. Ensuring the objective evaluation of scientific research through open review.
7. Respecting intellectual property rights through these systems.
8. Ensuring academic integrity through systems such as PMB and Dspace for managing academic libraries, by ensuring the organization of academic research: Master's theses, PhD dissertations, books, articles, etc.
9. Continuous documentation through storage with guaranteed secure protection of information about that research.

²⁴ Jean-Marc Amon, *Libre et Open Source, Avantages et inconvénients*, On Website: <https://marclabs.com/libre-et-open-source-avantages-et-inconvenients/> Viewed On(11/12/2023)

²⁵ *Open source software*. On Website :<https://ar.wikipedia.org/wiki/%D8%A8%D8%B1%D9%85%D8%AC%D9%8A%D8%A7%D8%AA%D9%85%D9%81%D8%AA%D9%88%D8%AD%D8%A9%D8%A7%D9%84%D9%85%D8%B5%D8%AF%D8%B1>. Viewed On(20/11/2022).

10. Open-source systems such as PMB and Dspace ensure sustainable development through long-term storage and dissemination.
11. Through open-source automated systems such as PMB and Dspace, researchers can publish their research, interact with the academic community, and exchange opinions and feedback.
12. Encouraging responsible scientific research by providing access to free and inexpensive resources.
13. Open-source systems like PMB and Dspace ensure social responsibility by monitoring the publication of academic research for all.²⁶
14. Ensuring proper citation of sources, thereby protecting the intellectual property rights of authors.²⁷

Conclusion :

Research ethics and its valorization are a set of principles and standards that govern the conduct of researchers and academic practices to ensure the integrity and rigor of research, and respect for the rights of individuals and communities affected by it. Research ethics encompasses a set of fundamental principles that researchers must follow to ensure that research is conducted and published in a sound and ethical manner. These ethical frameworks promote social responsibility in scientific research by ensuring that scientific knowledge is accessible to all, leading to improved education and research applications in communities.

Open-source library management systems contribute significantly to strengthening research ethics by ensuring transparency, collaboration, academic integrity, respect for intellectual property rights, and open access to knowledge. These systems provide an open and transparent environment, which helps to value scientific research by promoting ethical and equitable academic practices.

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²⁶ Ahmed Al-Otaibi, The Ethics of Scientific Research in the Modern Era, 2020, p. 45.

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