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Knowledge Management Systems for Libraries in Cameroon: Exploring the Potential of AI Solutions

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Abstract

Libraries are vital for supporting the socio-economic development of a country. The developments in Artificial Intelligence (AI) and technologies, come as a gateway to improve library services in Cameroon and in its way support the Country to achieve emergence by 2035. This research focuses on the use of technologies, particularly the adoption and application of AI and machine learning in Libraries in Cameroon. The research objective set to guide the study was how the use of technologies and the application of AI could be utilized to effectively improve library operations, particularly in organization knowledge. Using Scopus analysis, we provided answers to the research questions. The research design was qualitative –both document and content analysis were primary sources for data collection. Literature was viewed in terms of empirical peer-review studies on AI and knowledge organization. The study presents a panoramic view of technologies used in different libraries, as well as the state of libraries in Cameroon, vis a vis technological advancement, Knowledge organization, AI awareness, and its transformative capabilities in improving library operations. The study proposes different AI technologies to be used to support knowledge organization systems. The study recommends amongst others that libraries in Cameroon should quickly adopt the application and use of Artificial Intelligence to improve library services, particularly knowledge organization systems and representation. However, the need for staff training, acquisition, infrastructure, governance, and policy remain major hindrances.

Keywords: Knowledge Management, Libraries in Cameroon, Artificial Intelligence in Libraries, Knowledge Organization, Indigenous knowledge, Cameroon.

Introduction

Cameroon is a country located in Central Africa. It is made up of 10 regions, has 240 ethnic groups, and covers a surface area of about 475,650 square kilometers (Mintoul, 2024). Its main languages are French and English. With an estimated current population of 27,914,536 million, Cameroon is particularly known worldwide for its football through some emblematic figures such as: Roger Milla (Fifa, 2017), Samuel Eto'o (Twitter, 2021), footballers, and recently Francis Ngannou (Forbes Afrique, 2023), the boxer. The country's economic situation sets a net annual GDP of 3.6% (World Bank, 2024) the minimum Guaranteed minimum inter-professional wage amounts respectively at: XAF 41,875 for State employees, XAF 45,000 for the agricultural and similar sector, XAF 60,000 for other sectors of activity (Spm, 2023). In the context of global inflation, the cost of living in Cameroon remains very low: 38.93 on a scale of 100 maximum on April 23, 2024 (Numbeo, 2024).

Like many African countries, Cameroon has embarked on a "digital transition" (Minpostel, 2023), which consists of modernizing or dematerializing its traditional administration by exploiting the opportunities offered by digital technology and in particular Information and Communication Technologies (ICT). However, Cameroon's digital sector faces several challenges: a high cost of internet services, outdated and insufficient physical and organizational infrastructure, and logistical constraints (Dejo & Nsaikila, 2017). It should be noted, however, that there has been a reduction in the digital divide in the country. Indeed, statistics show that 12.89 million Cameroonians have access to the Internet and 3.90 million to social media (DataReportal, 2023), which are dynamic and collaborative platforms for sharing content. In addition, while digital technology becomes more popularized, access to knowledge in libraries places to make information, knowledge, and culture available (Carbone, 2023), increasingly remains limited. It should be noted that the integration of digital technology in Cameroon has not put an end to the use, function and services of libraries. It has barely disrupted a pre-established order where it was the user who had to go to a physical room to access documents, and the librarian seen as the sole custodian of information. With digital technology, the relationship between users and libraries has undergone a paradigm shift. The user has the choice to go physically or virtually (remotely) to the library. This evolution gives libraries both challenge and the supremacy to perform critical information functions such as communication, mediation, document processing, and knowledge management, in less time and with few

resources. In addition, the synergy between documents, library users, and libraries has been transformed and optimized thanks to new user demands, new services and new practices. In this dynamism, it is common to find knowledge organization systems (KOSs) in Cameroonian libraries such as "systems that would facilitate the organization and representation of knowledge in a specific domain: entity-relationship model, conceptual model, semantic network, taxonomies associated with a classification system, thesaurus, formal or semiotic ontology, and folksonomy" (Mahé & al., 2010). In other words, a system to access digital information will facilitate the identification and selection of information related to a domain by a user based on the availability of multiple repositories of knowledge organization.

However, the advent of digital technologies and AI, in particular, is seen as a threat that questions the value and usefulness of libraries, given the fact that the latter was initially the primary source of information and knowledge - knowing that on the digital in general and on the web in particular, it is possible to access the same services offered by the library sometimes free of charge.

Artificial intelligence is seen as a set of advanced technologies that allow 'machines to mimic certain features of human intelligence, including features such as perception, learning, reasoning, problem-solving, linguistic interaction, and even the production of creative work (Kiyindou & al., 2022). Librarians, researchers, the media, and even the government of Cameroon are aware of the importance of adopting and integrating AI in information and communication services. From the 4th to 6th of March 2024, Cameroon hosted a "UAR-UNESCO" summit (Uar-Aub, 2023) on Artificial Intelligence and the media. The library can be likened to this medium of communication through its role in promoting access and disseminating information, knowledge, and culture. However, the question that flows in the minds of professionals is ‘To what extent can the application of artificial intelligence improve library services in particular knowledge organization systems, and increase access to knowledge in Cameroon's libraries?

In this article, we examine libraries in Cameroon, knowledge organization systems, and the impact of artificial intelligence on KOS and library operations, as well as ethical considerations. It should be noted that the progressive development and deployment of technologies, with 12.89 million users for the internet and 3.90 million for social media (DataReportal, 2023), constitutes an ecosystem conducive for the integration of artificial intelligence in library operations in

Cameroon. This technology could be coupled with knowledge organization systems: a digital information access device that will facilitate the identification and selection of information related to a domain by a user based on multiple knowledge organization repositories (Mahé & al., 2010). To what extent, therefore, can the application of artificial intelligence be integrated in library operations, and how can it be implemented in a knowledge organization system to reduce the problem of limited access to information and knowledge in Cameroon's libraries? We used Scopus analysis to provide answers to these questions.

Research Objectives:

- To investigate how different technologies particularly AI can influence Knowledge Organization in Libraries
- To provide ways in which AI can be integrated into library operations.
- To identify a variety of technologies used in libraries for Knowledge Organization.
- To find out the advantages of integrating AI in Libraries in Cameroon.

Methodology

The research design was qualitative – using both document and content analysis as primary sources for data collection. Scopus analysis provided answers to the research objectives. Different types of libraries in Cameroon were targeted. Literature was viewed in terms of empirical studies on libraries in Cameroon, knowledge organization and AI.

Discussions

Libraries in Cameroon - Panoramic View

From the outset, it seems somewhat complex to draw up an exhaustive map of existing libraries in Cameroon. However, it should be remembered that IFLA (International Federation of Library Associations and Institutions) offers an overview of the different types of libraries that should exist in a country: National libraries, University (academic) libraries, Public libraries, Community libraries, School libraries, and today Virtual libraries. According to data collected by IFLA in 2021 (IFLA, 2024), Cameroon has, respectively: (0) national library, (94) academic libraries, (203) public libraries, (0) community library, (1330) school libraries and (205) other types of libraries, for a total of 1832 Libraries. Not all libraries necessarily have the same type of patrons or information resources. Thus, we think it is wise to revisit their definitions.

A national library is "responsible for acquiring and maintaining copies of all relevant materials published in the country where the library is located" (Ifla, 2019). The goal of the university library is to provide its users (students, undergraduates and post-graduates, researchers, teachers) with scientific resources that stimulate research activity (Gagnon & Farley-Chevrier, 2004). In other words, its mission is to support its institution in teaching, learning and research. The public library, on the other hand, focuses on the inhabitants of a specific geographical area (city, village, and neighborhood) and receives financial support from public authorities (Ifla, 2019). The community library provides "library services to the population of a local or regional community and may be managed and funded by community groups, charities, NGOs and other organizations." (Ifla, 2019). A school library serves pupils, students and teachers in the primary, secondary, and high school. The mission of these libraries is to supplement the education received at home by providing their users with "books, journals and other information resources that develop critical thinking, and to enable the effective use of information regardless of its form or medium" (Charest & Falardeau, 2021). However, there are other types of libraries - specialized in specific domains like Medical Library, Law library, and Environmental library. Contextually, Cameroonian has similar challenges with other African countries (Nigeria, Uganda, Tanzania, Ethiopia) but still has its own specificities which constitute warning points that interrupt the effective functioning of the library. We categorize them into four areas: staff training, infrastructure, management of physical and digital resources.

Indeed, the number of institutions authorized to train professionals in Library and Information Science (LIS) in Cameroon are few and thus considered insufficient. Some of these institutions are not always fully up to date in terms of standards and the evolution of the librarian's profession. The training offered is sometimes disconnected and decontextualized in relation to the needs and demands of the Cameroonian labor market. In addition, the lack of state-of-the-art technological infrastructure makes it difficult for learners to fully practice the profession, and the costs of specialized courses are often exorbitant compared to so-called generalist courses. In addition, there is a lack of updating of the skills of library professionals, a weak process for capturing and preserving indigenous knowledge (orality, books, etc.), as well as a low valuation of the librarian profession and the information-documentation professions by private and public sector companies. There is an acute shortage of qualified library professionals for the Cameroonian market (Bawack, 2019). There has also been a massive reorientation of librarians towards other, more lucrative professions with better career prospects

(Burnett, 2013). These challenges have greatly and negatively impacted the library and information science sector in Cameroon.

At the level of infrastructure, very few libraries comply with ISO 9001:2015 (quality management systems) (ISO, 2015), ISO11620:2023 (library performance indicators) (ISO, 2023), ISO 14001:2015 (environmental management systems, requirements and guidelines for its use) (ISO, 2015) and ISO26000:2010 (ISO, 2010) (Guidance on social responsibility) (Ksibi, 2012). The access control system, which is often traditional and not integrated with information and communication technologies (ICTs), is ineffective in preventing unauthorized access vandalism of premises, and furniture. In addition, protection for library staff is limited or absent. The energy divid from constant power outages results from the lack of energy alternatives and sometimes an insufficient budget for implementation (Shafack, 2021). There is constant outages and the absence of state-of-the-art infrastructure (Bawack, 2022).

When it comes to physical records management, libraries face threats such as theft and vandalism of information resources. In addition, collection development is non-existent in some libraries, and in most cases physical books and journals are often obsolete (Bawack, 2022), and do not reflect the African context. It would be wise to rehabilitate and "Africanize" these resources to better meet both institutional and local needs (Zimu-Biyela & Chisita, 2023). The financial resources made available to libraries for subscription and book purchasing, whether local or foreign, are limited and sometimes absent (Bawack, 2022). It should be noted that this dilemma has negative consequences on the visibility of Cameroonian booksellers and publishers. It also affects research quality.

In addition, the preservation of "indigenous knowledge", which represents the knowledge specific to a civilization, a people or an ethnic group (Sithole, 2006), is both time-consuming and costly, as it requires the use of specific conservation tools. We also note the absence or non-updating of acquisition policies adapted to the needs of users. In addition, the often-limited space allocated to physical library holdings hinders an orderly and comprehensive shelving of all available resources.

However, although digital technology and the internet are bringing in significant changes in Cameroon, it is important to note that not all libraries in the country have access to this network. This has significant implications, as only a small number of libraries have web-based visibility.

The online presence discussed in this article is associated with search engine referencing, whether it is map engines, image engines, social networks, directories or other platforms. For example, data from Google Maps map search engine (Appendix 1) reveals the existence of 22 libraries for the cities of Yaoundé, Douala and Buea (Appendix 2). Compared to physical management, the digital management of library collections within Cameroonian libraries poses more problems. Indeed, one of the main difficulties of digital management lies in the rights of access (subscription) to aggregators of documentary resources such as portals, databases, digital libraries, and bibliographic catalogs. Many libraries, seeking to reduce their acquisition costs, opt for subscriptions to periodicals, books, and encyclopedias. However, in Cameroon, only a few libraries have the opportunity to benefit from this access due to budgetary deficit.

- **CAIRN.INFO** is a documentary resource portal specializing in the humanities and social sciences. It is accessible through the libraries of three higher education institutions: the Catholic University of Central Africa (UCAC-ICY, 2024), the Saint Jerome Catholic University of Douala (CATHO SJD, 2024) and the French Institute of Cameroon (IFC, 2024).
- **OPENEDITION.ORG** provides access to electronic resources in the same field, including journals, books, research notebooks, and event announcements, but is not currently linked to any library in Cameroon**.**
- **PROQUEST.COM** a database in the humanities and social sciences that includes academic publications, books, videos and audios, theses and dissertations, and others. She is not affiliated with a Cameroonian library for the time being.
- **EBSCO.COM** a database for academic libraries that offers a search engine, ebooks, digital magazines, and services. It mentions the American School of Yaounde (ASOY, 2024) as a subscriber.

However, even if libraries in Cameroon do not have a subscription to the tools mentioned above, they use the potential of open access to offer their users several tools that make documents available without restriction (Appendix 3). Proposed by the CNRS (CNRS, 2024), this appendix provides a non-exhaustive list of tools. It should be noted that the International Network for the Availability of Scientific Publications (INASP) has offered free subscriptions to a variety of journals to academic libraries that are members of the consortium. Though the consortium (COCUREL) is dwindling with governance issues, the University of Bamenda and the University of Buea libraries are still benefiting from these free digital resources.

Another obstacle that has plagued the library ecosystem is ICT expertise (web development, database management, social media usage and management, systems and network administration, IT maintenance, plagiarism control, and cybersecurity). Very few libraries have qualified staff (librarians, photo librarians, media librarians, iconographers, etc.) capable of managing their digital documentary concerns. In cases where internet access is available, it is often prone to slowness and interruptions due to a lack of low bandwidth, poor skills, insufficient maintenance, and even policy decisions (Okafor, 2020). In addition, some library users have low digital literacy rates, which does not always facilitate the proper use and management of these technologies. These users represent risks for libraries and their information systems, such as cyber threats, malicious intent and clumsiness. Another aspect is the limited availability of scanners for document processing librarians, as well as the availability of copiers to make copies of documents for users, with the aim of extending the life of documents. In addition, the validity and rapid obsolescence of some document formats make it difficult for librarians. And finally, copyright infringement through copying and misdistribution by patrons without the library's consent (Sahabi & Otobo, 2021).

Knowledge Organization in Libraries: How is it done?

From the outset, the organization of knowledge has always been at the heart of libraries' concerns. Thus, they used different classification systems to classify knowledge such as the Dewey Decimal Classification (CDD) (OCLC, 2003) developed by Melvin Dewey in 1876, the Library of Congress Classification (LCC) (LOC, 2024) by James Hanson and Charles Martel (1897), and the Universal Decimal Classification (UDC) (UDCS, 2024) by Paul Otlet (1905). Later, Shiyali Ramamrita Ranganathan introduced the Facet Classification (Glushko, 2020) in 1933, while Keyes D. Metcalf and Mary Louise Marshall established the National Library of Medicine Classification (NLM) in 1948. This was followed by Brunet Parguez's Systematic Classification in 1968, and Eduard Sukiasyan's Library-Bibliographical Classification (LBC) (Sukiasyan, 2015) between 1960 and 1990. The Book Industry Study Group (BISG) (BISG, 2024) developed the Book Industry Standards and Communications (BISAC) system (BISG, 2024) in 1995. These systems have been developed both internationally and locally by libraries and are still used to this day by some libraries around the world and Cameroonian libraries in particular. However, with the advent of digital technology, libraries have shifted to digital knowledge organization systems to respond to the new potentialities offered.

The Concept of Knowledge Organization Systems (KOS)

The KOS is a tool that allows the user to find his or her way around. It has the particularity of organizing knowledge into a collection of concepts associated with a domain of knowledge (Abdallah, 2012). It is also a tool that facilitates and concretizes the implementation of a knowledge management process. More specifically, in the context of a library, knowledge management consists of putting in place a set of organizational strategies that allow the identification, document processing, and availability of the knowledge held by a librarian (Tanti, 2017). A KOS has several components:

- **The knowledge repository** is a storage location for the permanent storage of heterogeneous documents such as images, sounds, texts and videos.
- **The domain ontology is** a disambiguation repository that allows all members of a community to speak the same language. It also allows for a hierarchical representation of a domain (parents and children).
- **Users** are considered a system-specific resource, as they are the ones who produce or use information.
- **Interactions** are a series of actions between components: repertoire, ontology and users. They collaborate as part of the information exchange process and co-construct a series of purpose-related sub-processes.

In addition, in the digital environment, and the four components mentioned above, a KOS can be backed by an **interface** in order to facilitate the link between the user and the system, generally referred to as a human-machine interface. An example is the case of ILMS (Integrated Library Management Systems) which are KOSs used by librarians to organize digital and physical resources so as to have a search tool for physical collection, and a system for processing, creating and enhancing digital documents. However, by analyzing a web corpus of five libraries via the Google Search engine, it appears that 80% of Cameroonian libraries opt for PMB (Search equation for finding PMBs: inurl:"/opac_css/index.php" AND site:cm), probably because of its simplicity of deployment (graphical installation interface), its architecture and the frequency of its updates (PMB, 2024). On the one hand, libraries such as the International War College of Yaoundé (ESIG) (ESIG,2024), the Catholic University of Central Africa (UCAC) (UCAC, 2024) and the OHADA Digital Library (OHADA, 2024) are among the users of this (SIGB). On the other hand, **20%** use KOHA (Search equation to find KOHA: allintext:"Powered by Koha" AND site:cm OR site:org) , especially SIL Cameroon, a choice probably influenced by the specific technical skills required by this solution, including

the use of a Linux operating system (Stallman, 2021), cataloging standards, etc. In Cameroon, 6.76% of computers run Windows (Microsoft, 2024) while only 0.28% use Linux (March 2024) (Statcounter, 2024). Ultimately, in addition to the ILS discussed above, there are also other open-source alternatives that Cameroonian librarians can exploit depending on their needs and the scale of their automation project: EVERGREEN (Evergreen, 2013), FOLIO (Folio, 2024), OPALS (OPALS, 2024), ABCD (ABCD, 2024), BIBLIOTEQ (BIBLIOTEQ, 2024). In addition to open-source Library Management Information Systems (ILS), there are also proprietary ILS that are little used by libraries in Cameroon, particularly for limited budget reasons. However, it can happen that an ILS incorporates artificial intelligence. This is the case of BGM (Library, Governance & Management) (GMINVENT, 2024), a document service platform that has most of the functionalities of an ILS system: a catalog to view and search at the heart of the documentary collection. Cataloguing: to allow the creation and import of bibliographic records, and the management of documentary resources. Acquisition: to manage the growth of collection development and monitor its acquisition budget. Circulation to manage internal and external lending activities. Communication for selective information dissemination campaigns (DSI) whether by e-mail or sms and finally the administration to manage rights, authority repositories, statistics and personalizations. In view of these elements, we can say that a KOS is not just an ILS, it can be a platform or any other document management device. However, what is artificial intelligence and how can it be integrated with KOSs to reduce the limited access to knowledge of Cameroonian libraries?

Integrating AI into a KOS for Libraries in Cameroon

From the outset, artificial intelligence is not an abstract concept, it is first and foremost a field of scientific study and a technology that aims to generate content, make predictions, make recommendations, or make decisions for humans based on concrete or real data (ISO/IEC 22989:2022) (ISO, 2022). For (Kiyindou et al., 2022) it is a "set of advanced technologies that allow 'machines to mimic certain features of human intelligence, including features such as perception, learning, reasoning, problem-solving, linguistic interaction, and even the production of creative work'". Artificial intelligence (AI) is a tool like any other (programming language, blockchain, virtual reality), but its power lies in the ability of its user or creator to provide it with a high-quality dataset and a large language models (LLMs) adapted to analyze this data. AI has been around since the 1950s-1956s (McCarthy, 1998) (Minsky & Papert, 1969), and its authorship is attributed to John McCarthy of MIT (Massachusetts Institute of

Technology). Over the decades, it has continued to evolve until it reaches its current form. However, in 2022, artificial intelligence saw a major turning point in the field of generative artificial intelligence thanks to the chatbot Chat GPT (Generative Pre-trained Transformer), launched by OpenAI on November 30, 2022.

What are the types of artificial intelligence?

To date we have 04 types of artificial intelligence, including *Artificial General Intelligence (AGI), which* aims to mimic or reproduce human brain capacities such as cognition, retention, calculation, etc. *Artificial Narrow Intelligence (ANI)* is based on natural language processing (NLP) technologies and focuses on a single function: conversing with the user. *Artificial Super Intelligence (AS)* aspires to outperform human intelligence in all areas, thereby reducing or eliminating the need for human intervention (Fourtané, 2019). Finally, *Generative Artificial Intelligence (GIA), or Generative AI (Gen AI),* a category of AI dedicated to the creation of new content or document reformulations (texts, sounds, images, videos) from a set of data on which it has been trained (Weforum, 2023).

When integrated into a knowledge organization system, artificial intelligence provides library users with the ability to adapt to textual formats, perform multilingual bibliographic cataloging, extract content from a holding, and simplify the process of converting documents from text to image to video. It also allows for efficient sorting of information resources (NSLA, 2023). It can improve accuracy in terms of documentary retrieval and automate routine administrative tasks (AJE - Journal Experts, 2023). In academic libraries, AI can be used to translate documents into foreign languages, synthesize scientific articles, generate and publish scientific content, and create and insert portions of content into a document (such as a table of contents, table of contents, bibliography, or literature review), (CHOICE Media Channel, 2022).

The impact of artificial intelligence and advanced computer technology on the nature of future academic libraries could be enormous and the quality difference varies among experts (Vijayakumar & Sheshadri, 2019). Hussain (2023) posits that AI is a vibrant technology that should be adopted by librarians in performing library services and library operations to accelerate service delivery.

Accordingly, Yusuf & al., (2022) posit that integrating artificial intelligence in library systems involves integrating KOS in services such as descriptive cataloging, subject indexing,

referencing, shelf reading, collection development, and information retrieval systems. Romero (2018) intimates that artificial intelligence could facilitate KO in areas related to searching and retrieval of new media with greater efficiency and effectiveness by library patrons and introduce them to new material they may never have found otherwise. In some African countries like Nigeria, academic librarians have perceived Artificial intelligence as a new driving force for the improvement of knowledge organization and the development of intelligent libraries. In a qualitative study conducted by Woods and Evans (2018), half of the librarians reported that AI will have a transformative effect on librarianship in the future, thus AI has little or no influence on present library functions.

In Cameroon, libraries can integrate AI into their knowledge organization system in two ways: the first is through the development of APIs (Application Programming Interfaces) to meet specific information access needs. The second modality is the use of plugins or modules. For example, a chatbot could be integrated into the interface of a KOS (Knowledge Organization System) using the iframe tag (HTML tag that allows you to embed external content on a web page (chatbot, social network, etc.). Initiatives already exist in this direction, such as Dastudy (Dastudy, 2024), a knowledge-sharing platform equipped with a conversational agent capable of searching through its document base.

Limitations of this Research

A major limitation of this study relies on the databases using Scopus. This may have some elements of bias which may affect the representativeness of findings which could affect the effectiveness of integrating AI in the library's processes of knowledge organizations. Additionally, variations in study design, methodology, and reporting standards across different studies can make it challenging to evaluate the reliability and robustness of the evidence accurately. Emerging research or innovative applications of AI and analytics technologies may not be adequately represented due to the time lag between research conduct and publication.

Conclusion

The systematic increase of artificial intelligence technologies has caused paradigmatic paralysis in the entire ecosystem of libraries, necessitating innovative approaches to meet the constantly changing user needs and operational challenges. Integrating AI and technologies emerges as the prime solution to enhance library services, efficiency, effectiveness, and satisfy user expectations. Findings reveal a cluster of technologies that are available for libraries to organize

information and knowledge like Koha, Evergreen, Folio, Opals, Abcd, Biblioteq. By leveraging the power of AI, libraries can stay at the forefront of technological advancements and provide efficient, personalized and innovative services to their users.

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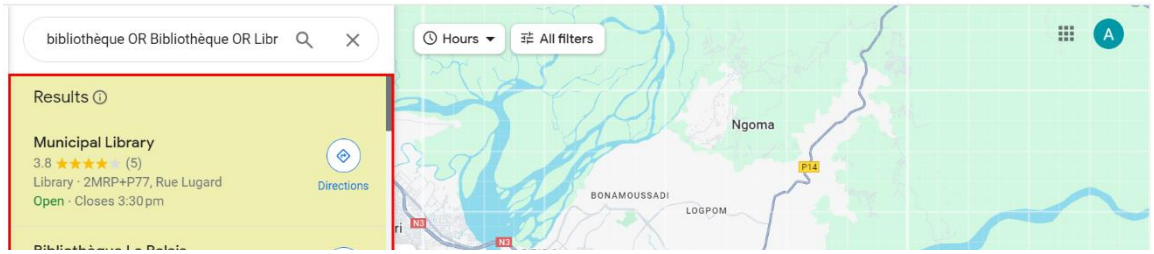
Appendix 1: Google Maps - Map Search Engine

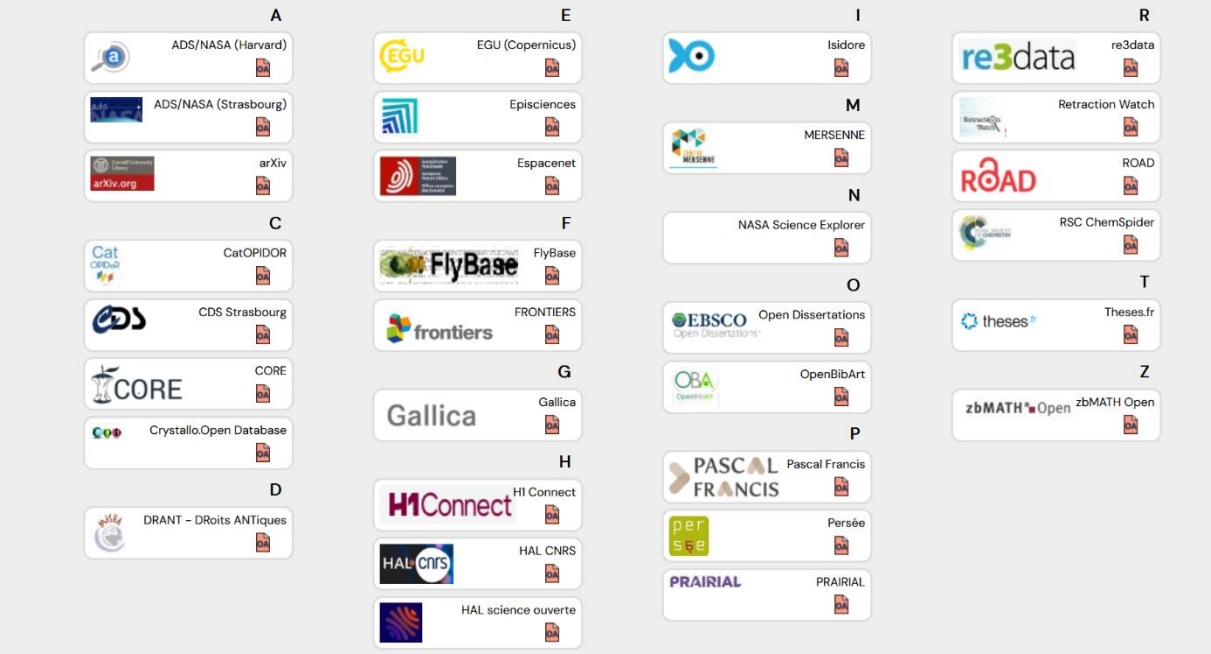


Searching Cameroon's Libraries on the Web

Appendix 2: Some libraries in Yaoundé, Douala and Buea

Bibliothèque	Type	Contact	Adresse
Centrale de lecture publique	Bibliothèque publique	6 99 27 39 74	Yaoundé
Bibliothèque Municipale de Douala	Bibliothèque publique		Rue Lugard, Douala
Anlu bibliothèque	Bibliothèque spécialisée	6 52 07 74 45	Carrefour Nyango, Douala
Bibliothèque Djaïli Amadou Amal à Douala	Bibliothèque municipale	6 77 26 61 75	Ndogpassi Carrefour Maître Fotso, Douala
Sportheque Bibliotheque Sportive	Bibliothèque spécialisée	6 94 88 50 86	Rue Sylvani, Douala
Bibliothèque Centrale de l'Université de Yaoundé I	Bibliothèque universitaire	242 06 47 28	Ngoa Ekelle, Yaoundé
Bibliothèque Universitaire	Bibliothèque universitaire		Carrefour Ange Raphaël, Université de Douala
American COorner University of Buea	Bibliothèque universitaire	6 76 30 68 47	University of Buea Library, Buea
CLAC YAOUNDE	Bibliothèque publique	2 22 78 25 70	Mimboman Liberté, Yaoundé
British Council Cameroon	Bibliothèque culturelle	6 77 47 41 56	Avenue Kennedy, Yaoundé
Maison des savoirs	Bibliothèque culturelle	6 99 57 74 47	Etoudi dépôt de sable, Yaoundé
University of Buea Library	Bibliothèque universitaire		University of Main Buea Campus, Buea
Bibliolibrairie de la Cène Littéraire	Bibliothèque spécialisée	6 98 98 62 80	Avenue Marc Vivien Foe, Yaoundé
ENSPT Library	Bibliothèque scolaire	6 77 07 81 51	Joseph Tchoungui Akoa, Yaoundé
EISERVI	Bibliothèque scolaire	6 77 43 63 33	Yaoundé
Centre Biblique de Douala	Bibliothèque réligieuse	6 77 90 82 32	Douala
Centre Biblique de Yaoundé	Bibliothèque réligieuse	6 99 54 84 15	Yaoundé
Bibliothèque ESIG	Bibliothèque scolaire	6 20 35 13 26	Yaoundé
Alliance Franco Cameroonian	Bibliothèque culturelle	6 93 39 59 87	Buea
Ila Cameroun	Bibliothèque culturelle	6 99 58 85 85	Akwa Carrefour Arno, Douala
SLZ-DOUALA	Bibliothèque scolaire	6 99 93 37 38	Douala
Goethe-Institut Kamerun	Bibliothèque culturelle	6 55 49 88 69	Rue Mballa Eloumden,Yaoundé

Appendix 3: Open Access Tools



Infographic produced by the CNRS