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Article

Leveraging open-source software to modernise public libraries in South Africa

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Abstract: Open-source software (OSS) has emerged as a transformative tool whose implementation has the potential to modernise many libraries around the world in the digital age. OSS is a type of software which permits its users to inspect, share, modify, and enhance through its freely accessed source code. The accessibility and openness of the source code permits users to manipulate, change, and improve the way in which a piece of software, program, or application works. OSS solutions therefore provide cost-effective alternatives that enable libraries to enhance their technological infrastructure without being constrained by proprietary systems. Hence, many countries have initiated and formulated policies and legislative frameworks to support the implementation and use of OSS library solutions such as DSpace, Alfresco, and Greenstone. The purpose of the study reported on was to investigate the leveraging of OSS to modernise public libraries in South Africa. Content analysis was adopted as the research methodology for this qualitative study, which was based on a literature review integrating insights from the researchers' experiences with the use of OSS in libraries The findings of the study reveal that the use of OSS has the potential to modernise public libraries, especially those located outside cities or urban areas. These libraries are often less well equipped with the necessary technology infrastructure to meet the demands of the digital age, such as online books and open access materials. The study culminated in an OSS framework that may be implemented to modernise public libraries. This framework may help public libraries to integrate OSS solutions and further allow users access to digital services.

Keywords: open-source software; public libraries; proprietary software; infrastructure

1. Introduction

Public libraries play a pivotal role in fostering education, community engagement and access to information, and therefore serve as hubs for the dissemination of information and knowledge (Shibambu and Mojapelo, 2024). Information and communication technology (ICT) is central to the way libraries operate and function. The widespread availability of digital devices and advanced computer software and systems has enabled libraries as well as information professionals to organise and store information and make it available to patrons (Mojapelo, 2019). This often makes it possible for users to access, search, and use the library information they need more rapidly and easily, regardless of their location and with due regard for their time constraints. However, many public libraries in South Africa, especially those outside the cities, are lagging in terms of offering online services to patrons because they lack the software necessary to manage library materials. Limited budgets often make it impossible to purchase expensive proprietary systems, restricting the library's ability to modernise and meet the increasing demand for digital resources and services (Muchaonyerwa et al., 2021). Hence, many public libraries around the world are turning to open-source software (OSS) in light of its numerous benefits, such as low

maintenance costs, adaptability, improved debugging, built communities, and fewer restrictions (Bwalya et al., 2019).

The prohibitively high cost of commercial library management systems can hamper the automation of routine library operations (Jin, 2019). However, the growing availability of open-source library management systems provides a cost-effective alternative, enabling libraries to automate their operations with minimal financial investment. Users of OSS are free to run, copy, distribute, examine, alter, share, and improve the program to suit their needs (Ngoepe, 2017). Libraries may benefit from these systems because they reduce the upfront expenses associated with the use of commercial software and offer more control over library operating environments (Sanchez et al., 2020). It is imperative that library professionals comprehend the advantages of OSS and take an active role in its creation and application, since most are not able to afford proprietary software solutions. Proprietary software is often costly and inflexible, and therefore unsuitable for most public libraries. Furthermore, proprietary software in libraries tends to lack centralised and standardised systems, which hinders collaboration between libraries. The implication is that when proprietary software is implemented in public libraries, it may limit or prohibit any potential resource-sharing opportunities as well as other fundamental community-driven initiatives.

Many governments and organisations around the world have taken advantage of OSS to further develop their various sectors such as in libraries, archives and records management, ICT skills development to name just a few. by adding features or fixing parts that do not always work correctly. Hence, OSS developers should distribute it with the understanding that the software be shared with others without limitations (Sanchez et al., 2020). This enables the global community to collaborate, share, and assist in meeting both individual and group goals. The software is therefore underpinned by peer production and mass collaboration, with the result being more sustainable software development for end users. OSS also encourages developers to share insights, ideas, and, most important, the source code to generate more innovative software solutions both collectively and individually (Drake, 2017). Richard Stallman is credited with shaping OSS in 1985, when he founded the Free Software Foundation (Ngoepe, 2017). As part of their OSS adoption and implementation strategies, many institutions and government have devised clear guidelines supported by policy, and in some instance legislative framework.

Open-Source Resources (2021) defines OSS as software whose source code anyone can inspect, modify, and enhance by adding features or fixing parts that do not always work correctly

Benefits associated with the adoption and use of OSS include the inclusion of users as role-players in the ICT industry, the further development of OSS, an increase in local ICT skill and knowledge development, and a narrowing of the digital divide (Jin, 2019), all of which have possible application in the context of public libraries in South Africa. OSS can be used as a tool for social change to improve software development knowledge in the country (Ngoepe, 2017). Operating in a developing country, South African public libraries could, through OSS, expand ICT skills development (Wheeler, 2015). Most important, the utilisation of OSS in public libraries may also help the country to reduce its reliance and dependency on foreign

companies or service providers for ICT solutions (Shekgola et al., 2021). By adopting open-source solutions, public libraries in South Africa can create a more dynamic and responsive environment, providing enhanced services to their communities while keeping costs under control. This approach fosters collaboration, innovation, and sustainability in the long run. Leveraging OSS to modernise public libraries in South Africa can bring numerous benefits, improving efficiency, accessibility, and user experience.

Public libraries, particularly those located outside urban centres, are suffering in the face of neglect and underfunding (Mojapelo, 2019). This tends to result in substandard services and limited access to information for communities. The problems encountered include funding disparities, technological inadequacies, and a general lack of prioritisation, all of which contribute to a diminishing contribution by public libraries to the socio-economic development of underserved regions (Shibambu and Mojapelo, 2024). This neglect translates into inadequate financial support, outdated infrastructure, and a lack of awareness about the critical role that libraries play in fostering education and community engagement and bridging the digital divide. Leveraging OSS presents a transformative opportunity to modernise these libraries, making them more efficient, accessible, and adaptable to the evolving needs of the community.

2. Problem statement

Public libraries in South Africa, especially those outside the cities, are struggling to keep pace with the technological demands of the 21st century. This tends to limit their ability to serve their patrons in these diverse communities effectively. Limited financial resources and reliance on traditional systems have resulted in outdated library infrastructure, restricting access to information and educational resources. As the digital divide widens, there is an urgent need to modernise public libraries, making them more inclusive, efficient, and adaptable to the evolving needs of the community. Implementation and use of OSS may be beneficial in resolving these problems, and in that way ensure that all patrons have equal access to the information, services and technological resources that public libraries should provide.

With many governments adopting OSS as a strategy to develop digital skills (Wheeler, 2015), besides offering a partial solution to narrowing the digital divide in developing countries, OSS also presents countries such as South Africa with numerous benefits, such as opportunities for growing local ICT skills development (Oreku and Mtenzi, 2013). Khan and Bhatti (2017) define digital skills as the ability to manage digital infrastructure, apply security software, outline policies, provide digital training, and use digital skills to back up digital content. Open-source solutions offer cost-effective alternatives that empower libraries to enhance their technological infrastructure without being constrained by proprietary systems (Shekgola and Ngoepe, 2025). The concept of OSS is characterised by transparency, collaboration, and community-driven development, which align well with the ethos of public libraries (Sanchez et al., 2020). OSS not only has the potential to provide a cost-effective solution, but also allows libraries to customise and tailor software to their unique requirements. This is particularly important in a country as diverse as South

Africa, where libraries serve communities with varying needs, languages, and cultural backgrounds.

As stated by Shibambu and Mojapelo (2024), the existence of public libraries in every community is not a privilege, but instead an essential requirement for access to information for community members. Therefore, bridging the digital gaps and ensuring that public libraries meet the dynamic needs of the population requires a strategic shift towards OSS solutions. Solving this problem is crucial not only for promoting digital inclusion, but also for equipping communities with the tools and resources necessary for lifelong learning and development. OSS adoption, implementation and use in public libraries is therefore vital for ensuring equitable access to information, knowledge, and resources for all members of society.

2.1. Purpose of the study

The purpose of the study was to investigate the adoption of OSS in public libraries.

2.2. Objectives of the study

The objectives of the study were as follows:

- Assess the significance of open sources software in public libraries in South Africa.
- Determine the types of open-sources software relevant in public libraries in South Africa.
- Identify the infrastructure needed to use open-source software in public libraries in South Africa.
- Identify the skills required to use open-source software in public libraries in South Africa.
- Recommend a framework that may be used to leverage open-source software to modernise public libraries.

2.3. Literature review

The literature review was structured according to the research objectives, and covered the following themes: significance of OSS, the types of OSS, and the infrastructure and skills required for the adoption and use of OSS in public libraries.

2.4. Significance of open-source software in public libraries

When used appropriately OSS can offer a cost saving, as it circumvents the costs associated with acquiring and maintaining proprietary software in public libraries. This is significant for public libraries that function under tight budgets. OSS can be customised to meet the specific needs of public libraries. Public libraries can modify the software to adapt to their unique workflows, user needs, and local community requirements, in that way achieving greater flexibility than what is offered by closed-source solutions (Dei and Tetteh, 2022). OSS often adheres to open standards, facilitating easier integration with other systems and services. This can enhance the ability of public libraries to share resources and collaborate with other public or even academic libraries. Public libraries making use of OSS are not tied to the financial

health or business decisions of a single vendor. This reduces the risk of software becoming obsolete or unsupported, allowing public libraries to maintain control over their technology infrastructure (Ballhausen, 2019). OSS can also promote digital literacy by allowing public librarians and public library users to learn about software development, coding, and system management. This can enhance users' technical skills and enable them to take fuller advantage of the potential offered by the digital age. OSS often offers public libraries greater control over data privacy and security. By using open-source solutions, public libraries can ensure that user data is managed in compliance with their privacy policies without relying on external companies.

Sanchez et al. (2020) suggest that public libraries that use OSS can experiment with new technologies and services without risking significant financial investment. This can lead to innovative solutions tailored to the needs of the community. OSS enables public libraries to participate in global initiatives and projects that promote the sharing of knowledge and resources, fostering a culture of openness and accessibility (Drake, 2017). Public libraries can collaborate in developing and improving open-source tools, pooling their resources to enhance the functionality and usability of the software. The adoption of OSS in public libraries can lead to increased efficiency, innovation, and community engagement, making libraries more responsive to the needs of their users while promoting a culture of openness and collaboration (Gupta and Yadav, 2018).

2.5. Types of open-source software in public libraries

South African public libraries, like many others globally, face the challenge of keeping pace with technological advancements while remaining inclusive and relevant to diverse communities. According to Katuu (2023), African countries are making very little progress in implementing technologies such as OSS in libraries when compared with developed countries. This is due to factors such as lack of organisational leadership support, budget constraints, skills shortages, and resistance to change. Moreover, there is limited awareness of the potential benefits associated with the adoption, implementation, and use of OSS (Katuu, 2023). Besides its role in bridging the digital divide, OSS is usually praised for granting users control over the intellectual property rights and functionalities of the software (Sanchez et al., 2020). This includes the fact that OSS offers users the ability to alter the source code, improve it and share it with others in a bid to ensure that the software meets their operational needs; furthermore, potential risks and mistakes can be detected and rectified.

Leveraging open-source solutions in public libraries can pave the way to modernised systems such as integrated library management systems (ILMS), digital library platforms, and collaborative tools such as Dspace, E-Prints, Open Biblio, Evergreen, and KOHA (Sanchez et al., 2020). This not only streamlines library operations, but also creates opportunities for offering digital resources, online courses, and improved communication channels. Furthermore, embracing OSS encourages collaboration with local technology communities, universities, and other stakeholders, fostering a culture of knowledge-sharing and mutual support (Dar and Ahmad, 2017). As South Africa strives for digital inclusion and knowledge democratisation, the modernisation of public libraries through OSS becomes a strategic imperative. This

approach not only has the potential to overcome immediate problems, but also creates the foundation for sustainable, community-driven library services with the capacity to adapt to the ever-changing technological landscape. A discussion of selected OSS follows.

2.5.1. Greenstone

Greenstone Digital Library Software (GSDL) is an OSS solution for developing digital libraries. According to Greenstone Digital Library Software (2022) this library management solution can be a multilingual software that is distributed under GNU General Public License. The software developers of Greenstone maintains that the software should encourage the effective deployment of digital libraries to share information and place it in the public domain. It was first developed in 1996 by the New Zealand Digital Library Project in 2000, at the University of Waikato's Computer Science Department. The software then received support and international cooperative partnership from the United Nations Educational, Science and Cultural Organisation as well as the Human Info NGO, based in Belgium, Antwerp. According to Greenstone Digital Library Software (2022), the main aim of the Greenstone software is to empower users, especially those in developing countries and particularly in public service institutions, universities, and libraries, to build their own digital libraries.

2.5.2. ePADD

ePADD is an open-source solution that was developed by Stanford University Libraries. It is a browser-based solution, and it is compatible with both Chrome and Firefox. Its seamless compactability and interoperability features ensures that it can fuction swiftly with most versions of Windows operating systems such as 7 SP1/10, OSX 10.12/10.13. On free and open-source software operating system such as Ubuntu 16.04 machines, ePADD is also compatible (Digital Preservation Coalition, 2022). This software assists users with appraisal, preservation, processing, discovery, and delivery of email records which are judged to possess historical or cultural value in society (Digital Preservation Coalition, 2022). ePADD solution is laude for pioneering seamless path that enable collection donors, records management professionals as well as researchers to easily donate, administer, curate, and access email collections (Digital Preservation Coalition, 2022). ePADD enables user to screen of all kinds of emails, including confidential and highly protected information. It further ensures that emails records of enduring value are preserved, as well as offering discoverability of such files to researchers.

2.5.3. D-Space

DSpace is an open-source repository software package that is used for developing open access repositories for published digital data (DSpace, 2022). It is commonly implemented by organisations building open digital repositories. DSpace platform is available for free to anyone permits users to modify, and even integrate the source code into their commercial application to fulfil the requirements. The developers of DSpace thus strive to improve feature such as accessibility, retrieval, support as well as the capacity to manage many digital materials. DSpace complies with many standard protocols for ingest, export and access, as such it supports a wide variety of data, such as film, photographs, books, theses, and 3D digital scans of objects, research

data sets and other forms of content (Digital Repository DSpace, 2025). DSpace application can manage and cope with large number of file format. Dublin Core is default metadata format used in DSpace solutions; however, it allows users to customise it for any application as per their requirements.

2.5.4. FEDORA

Flexible Extensible Digital Object Repository Architecture commonly known as FEDORA is a flexible, robust, and most interoperable open source. As a library repository system, it is widely used for management, preservation as well as for dissemination of electronic or digital contents. Wilcox (2017) allude that this library solution is also embraced for enhancing digital libraries and archives, in terms of easy access and preservation of materials. It enables the provision of specialised retrieval, access, and location of large and complex digital collections. As such, it also offers secury and curation of cultural and historic materials including scientific data (DuraSpace 2016). As such, FEDORA is one of the mostly used solution and boost worldwide base of intuitions such as museums, libraries, archives and even universities. As a community-based solution, its high adoption rate is spiked by the ability to interoperate in various standards, suitable for ensuring long-term sustainability (Wilcox, 2017).

2.5.5. Evergreen

Davis (2024) describes Evergreen as an open-source software that is able to integrate library system (ILS). Mobius Consortium (2025) points that Evergreen library solution is embraced in various libraries because of its capabilities of managing almost every aspect of library services. For instance, it a solution that is a suitable tool to use for patrons to locate library materials, management patrons accounts as well as enabling library staff to catalogue, manage and circulate materials. Evergreen is also considered one of the flexible and scalable open-source solution for libraries of all sizes (Mobius Consortium, 2025). Evergreen software solution was developed by the Georgia Public Library Service in 2006, in collaboration with Public Information Network for Electronic Services (PINES) as well as the Evergreen Community. This library solution is distributed under the free and open-source software public licence known as GNU. According to Davis (2024) Evergreen library solution is written mainly in Perl and PostgreSQL and consist of few optimised sections rewritten in C. PostgreSQL is an open-source object-relational database system that has earned a strong reputation for reliability, feature robustness, and performance. The catalogue interface Evergreen library solution is predominantly JavaScript with XHTML, and I boost a user interface which is written in Mozilla's XUL (Davis, 2024).

2.6. Infrastructure needed for the adoption of open-source software in public libraries

Implementing OSS in libraries requires careful planning and consideration of various aspects of the technology infrastructure (Dar and Ahmad, 2017). Existing hardware infrastructure needs to meet the requirements of the selected OSS. In addition, the computers for staff and public use must be compatible with the software (Drake, 2017). It must be ensured that computers that will be used by libraries meet the OSS system requirements. This will also ensure that application and system

software is able to function well in tandem. Using open-source operating systems such as Linux may be beneficial due to its easy-to-use interface and for reasons of cost-effectiveness.

Libraries often need servers to host OSS applications, especially for integrated library systems (ILS) such as cataloguing and digital repository systems. These can be either physical servers, or cloud based. Therefore, libraries must carefully check server capabilities, storage capacity, and network infrastructure to support OSS (Corrado, 2022). The ability of libraries to ensure reliable internet connectivity via computer terminals, computers, and other devices is very important. Stable Wi-Fi connectivity supported by a network is required. A back-up power supply in the form of solar panels or power generators should be readily available in case the primary library power source fails. Compatibility between operating systems for the OSS and the library's servers and computers should be prioritised. Network equipment such as reliable routers, switches, and possibly load balancers to handle the data traffic and ensure smooth operation of the software across the library are important and must be available (Corrado, 2022).

Knowledge, skills, and staff training are key in the context of OSS implementation in libraries (Bwalya et al., 2019). This applies to IT staff, patrons, and potential users of the system, all of whom need to be equipped with the necessary skills to work with open-source technologies. Initiatives and workshops are therefore needed to ensure that training programmes are offered to expand the expertise of staff and the users of open-source tools. Once key staff members have received training in the use of OSS, they will be able to ensure that the system adheres to robust security measures. Libraries around the world need to prioritise security in the context of large and ever-expanding collections of digital materials (Corrado and Moulaison, 2014).

The security of libraries is essential in ensuring that material remains accessible and usable and continues to be used over long periods of time (Cripps, 2011). Implementing best practices for secure coding in OSS is vital to ensure that intruders and potential system threats are detected quickly. Moreover, competent staff are vital in ensuring that systems are regularly updated and that patches to mitigate security vulnerabilities are installed (Bwalya et al., 2019). This can be achieved through the use of security tools and scanners to identify and mitigate potential threats. Most important, the staff should ensure scalability to accommodate future growth in library services and user demands. The library's choice of open-source solution should therefore ensure horizontal and vertical scalability based on requirements (Bwalya et al., 2019).

OSS provide less costly security solutions as compared to others. According to Karume and Mbugua (2012), the freely detailed review of source code made possible by OSS is because OSS products, allow its users to adequately fix problems without having to wait for assistances of any vendor. By contrast, with rented proprietary solutions, they usually are exposed with security vulnerabilities as only one person may have the powers to update or upgrade the software (Buffett, 2014). Techopedia (2012) further support that Linux technology based on open-source solutions are more dependable and safer than proprietary operating system such as Microsoft Windows. This makes Linux operating system and many similar open-source software solutions

more attractive to many countries and organisations dealing with information and communication technology.

2.7. Skills required to use open-source software in public libraries

In order for public libraries to use OSS effectively, public librarians require specific technical skills relating to the adoption and use of OSS. They need to be familiar with operating systems, file management, and basic troubleshooting. They also need to understand how to install, configure, and update OSS applications on different operating systems (Ballhausen, 2019), and must have the skills to manage servers and databases, particularly for library management systems or digital repositories. They also require knowledge of data backup processes and recovery techniques so that they are able to safeguard the library data. Knowledge of metadata standards (e.g., Dublin Core, MARC) for organising and managing library collections is also necessary (Gupta and Yadav, 2018).

Public librarians must understand basic cybersecurity principles in order to protect library systems and user data and must be able to assist users who have OSS-related questions and issues (Gangadhar et al., 2017). They must also train users on how best to use OSS effectively in public libraries and must be able to work in teams and collaborate with other libraries or community organisations on OSS initiatives. By developing these skills, library staff can effectively leverage OSS to enhance library services, engage with patrons, and contribute to the broader community of open-source users (Jin, 2019).

3. Research methodology

This qualitative study used content analysis as the primary research methodology based on a comprehensive literature review based on open-source software (OSS) for public libraries in South Africa. The literature review approach includes using a variety of search engines such as EBSCOhost, Web of Science, ResearchGate as well as Google Scholar, to name just few. These websites played a pivotal role to connect the researcher with a wide range of relevant information. The study further narrowed the scope by using specific keywords, which led to the discovery of an adequate scholarly sources. The researchers used thematic analysis, a technique developed by Braun and Clarke (2013), to systematically analyse qualitative data. This entailed reviewing, synthesizing, and analysing data by categorizing it based on the major research objectives relevant to the issue under examination. The acquired and extracted data were then summarised and documented to provide for a more contextual and relevant understanding of the topics under examination. The findings were organised into topical areas, such as OSS in libraries and the skills and infrastructure needed to deploy OSS in libraries.

4. Findings of the study

The study revealed the cost of OSS to be significantly lower than that of acquiring and maintaining proprietary software in public libraries. The availability of OSS is especially beneficial for libraries with limited budgets, as it offers a cost-effective alternative to proprietary solutions. By adopting OSS, public libraries can share

information resources and collaborate with other institutions, since OSS requires no financial investment for access (Dei and Tetteh, 2022). Additionally, OSS is cloud-based, facilitating resource-sharing among public libraries in South Africa. However, for OSS to be effectively utilised, public librarians must possess digital literacy skills to operate these systems and train users.

The study also revealed the range of OSS available for public libraries, including Greenstone Digital Library Software, ePADD (a free open-source tool developed by Stanford University Libraries), DSpace (used for open digital repositories), FEDORA (for managing digital content), Evergreen (an open-source integrated library system), and EPrints (a software package for building open-access repositories) (Singh, 2007).

Furthermore, the study emphasised the need for proper technological infrastructure to support the adoption and use of OSS in public libraries. This infrastructure includes computers, servers (either physical or cloud-based), and network equipment such as routers, switches, and load balancers to manage data traffic. Furthermore, public librarians must possess a range of skills, including technical expertise, computer proficiency, project management, and communication skills, to ensure the successful implementation and use of OSS in public libraries (Corrado and Moulaison, 2014).

5. Recommendations

On the basis of our study, we recommend the adoption of OSS in public libraries to help them manage their services more efficiently, especially given their limited budgets. Implementing OSS allows public libraries to manage and deliver services digitally while facilitating resource-sharing among libraries. The framework we propose, set out in the **Figure 1** below, emphasises the importance of using OSS, supported by the necessary infrastructure and the skills required by public librarians to leverage OSS effectively so as to render high-quality library and information services.

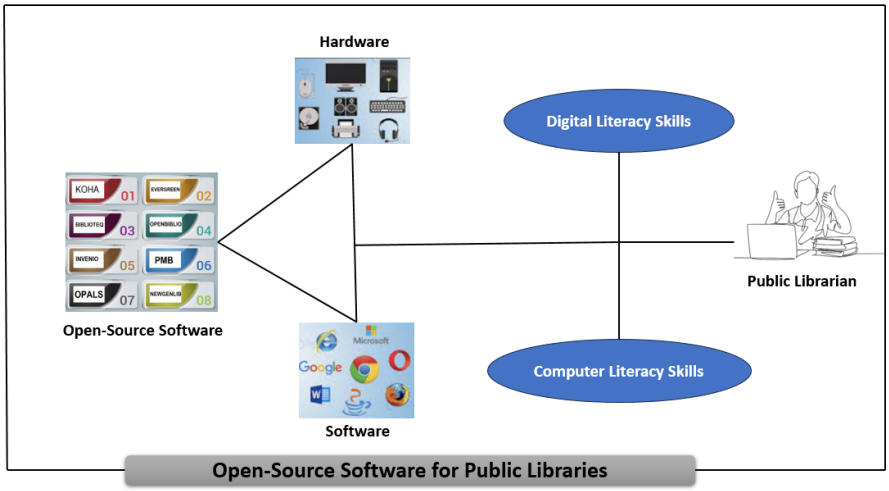

Figure 1. Framework for the adoption of OSS in public libraries (Shekgola, 2025).

The framework begins with public librarians equipping themselves with the necessary skills to effectively implement OSS in libraries. To achieve this, public

librarians must first develop robust computer literacy skills, which will enable them to operate computers efficiently and manage computer servers within the library environment. Computer literacy entails the ability to navigate various components of computers, including operating systems, software, and hardware, ensuring that librarians are sufficiently competent to respond to the technological demands of modern library services.

In addition to computer literacy, public librarians must also possess digital literacy skills to facilitate the provision of digital services in public libraries. These skills will enable librarians not only to use digital platforms themselves, but also to train library users on how to access and utilise digital platforms, such as OSS, for seamless information retrieval. By being digitally literate, librarians can empower users to navigate digital library resources with ease, enhancing the overall user experience.

The successful adoption of OSS in public libraries requires the right hardware infrastructure. This includes essential components such as computers, central processing units (CPUs), and reliable Wi-Fi for high-quality internet connectivity. Quality internet access is crucial, as it allows public librarians and users to access OSS platforms and digital library services from any location at any time. Moreover, access to the appropriate software, such as Microsoft Office, Google services, Internet Explorer, and Google Chrome, is necessary to ensure that librarians are able to interact efficiently with OSS in public libraries.

With adequate ICT infrastructure in place, public libraries can download and integrate various OSS platforms to enhance their services. Library management systems and databases, such as KOHA, BiblioteQ, Invenio, OPALS, OpenBiblio, PMB, and NewGenLib, can be embedded within the OSS framework. These systems enable public libraries to manage their collections, circulation, and digital services more effectively. Moreover, OSS platforms allow for the sharing of information resources across libraries using the same system, fostering collaboration and resource-sharing among public libraries. The adoption of OSS in public libraries is essential for managing and rendering digital services to users. By building the necessary skills and infrastructure, public librarians can ensure that they provide modern, efficient, and accessible services to their communities.

6. Conclusion

It is evident that open innovation technologies such as OSS have transformed many traditional libraries to digital libraries, as way to service the needs of various patrons. This further indicate that OSS has the ability to modernisation public libraries to provide seamless access to digital resources, especially those that cannot keep up with high costs and closed source code by proprietary software's. OSS thus can ensure that provision of online educational programmes by libraries is improved, as well as aid in enabling users to engage effectively in the modern age. Since most public libraries that are located outside the major cities of South Africa tend struggle to attract funders and required technology to modernise their libraries, OSS offer an opportunity that should not be missed. The adoption, implementation, and use of open-source

software rather than proprietary software may thus assist in equipping these public libraries with the required infrastructure to offer the services that are currently missing.

Conflict of interest: The author declares no conflict of interest.

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