The 8th Open Society Conference (OSC) 2026
Faculty of Law, Social and Political Science
Universitas Terbuka
DOI: doi.org/10.33830/osc.v4i1.9332 / ISSN: 3032-2227

Strengthening Resilient Library and Information Ecosystems through Intelligent Enhancement of Indonesia OneSearch

Muhammad Ridwan[1], Aam Mariyamah[2]
[1] Universitas Islam Negeri Sumatera Utara, Jl. Lapangan Golf, Durian Jangak, Tuntungan, Pancur Batu, Kabupaten Deli Serdang, Sumatera Utara.
[2]Universitas Terbuka, Jalan Cabe Raya, Pondok Cabe, Pamulang, Tangerang Selatan 15437, Banten.
e-mail: muhammadridwan@uinsu.ac.id

Abstract

Indonesia OneSearch (IOS) is a national knowledge infrastructure that is positioned as an open-access discovery system to mitigate information accessibility disparity across Indonesia. Although IOS has already aggregated millions of records in its system, the technical foundation of IOS has not been fully maximized to produce an equitable information utility. This study conceptualized a transformation framework to position IOS as an adaptive and inclusive national knowledge infrastructure. A systematic literature review and policy document analysis were performed to explore IOS transformation. 17 literature sources were screened, and 12 articles were selected for this study, of which 11 articles were retrieved from Scopus and google scholar database. The findings demonstrated that IOS transformation requires more than metadata formatting issues, which include metadata decay, organizational capacity, human resource readiness, experimentation culture, governance, and semantic negotiation among stakeholders. This study produced a smart library transformation framework that entails 4S (Smart Services, Smart People, Smart Governance, and Smart Place) dimensions and 11 strategies from the National Library Network Roadmap 2025-2029 to transform IOS. The findings recommend applying intelligent systems such as Natural Language Processing (NLP) for Knowledge Graph construction to overcome data atomization, recommendation systems for personalized services based on user information behavior in the generative AI era, and text-to-speech technologies to improve accessibility. This study concludes that a sociotechnical transformation framework can position IOS as a sustainable national knowledge infrastructure by evolving it from a metadata portal aggregator to a smart library ecosystem.

Keywords: *Indonesia OneSearch, digital library, information access, knowledge infrastructure, resilient library, information ecosystems*

INTRODUCTION

Digital transformation has driven libraries to build interconnected information networks through online public access catalogs (OPAC), institutional repositories, digital archives, and various other electronic information resources. Digital transformation shifts the paradigm and main challenges of libraries, which used to be mere storage for collections, into services integrated with technology, data management, and effective information utilization[1].

A smart library is an innovation that integrates advanced digital technology into library systems to create an inclusive and adaptive knowledge ecosystem[2]. Its development is currently transforming from ordinary digital systems to an integrated

Copyright © 2025, Muhammad Ridwan and Aam Mariyamah.

DOI: doi.org/10.33830/osc.v4i1.9332 / ISSN: 3032-2227

information environment. This information environment systematically connects intelligent technology, user-oriented services, human resource competencies, as well as physical and digital spaces in libraries[3].

The application of smart library principles serves as the main foundation for the development of the national information ecosystem. This foundation necessitates the formation of national knowledge infrastructure, an integrated ecosystem consisting of policies, institutions, technologies, and digital resources (such as databases, libraries, and information networks) that are managed nationally to support the production, storage, dissemination, and utilization of knowledge for research, innovation, and economic development purposes[4].

Indonesia OneSearch (IOS) has a role in supporting the connection of many information resources in Indonesia. Indonesia OneSearch (IOS) was created as a search system that links libraries and information institutions such as public libraries, special libraries, schools, universities and other institutions. In the phase of development Indonesia OneSearch (IOS) successfully built a fairly large network of contributors. Latifahs 2017 study noted that the usage level of Indonesia OneSearch (IOS) was relatively low on Java Island and mainly used basic search features with 46,021 searches while advanced searches counted only 579[5]. These results can indicate the potential of Indonesia OneSearch (IOS) as more than only search portal, it also functions as infrastructure that connects information resources among institutions to enable the nation's knowledge access. This finding suggests a disparity between offering the data integration and the Indonesia OneSearch (IOS) usage effectiveness, by users.

However lately Indonesia OneSearch had gained progress. In 2025 Amaliah and colleagues found that Indonesia OneSearch has entered a new phase. The new phases are: building portals doing text analysis using language tools and providing services that check for copied content. Indonesia OneSearch now connects 2,444 partner institutions, 3,302 libraries and 9,539 digital collections holding than 8.6 million library records. The biggest contributor is the education library sector giving more, than 5.7 million information resources[6].

The growth of Indonesia OneSearch (IOS) shows that making roles clearer getting more people involved and using networks better are still goals for the country's information system. The National Library Network Roadmap 2025–2029, drafted by the Indonesian Higher Education Library Forum (FPPTI) lays out steps for Indonesia OneSearch. These steps include coordination and advocacy spreading the word about using collections, improving services and keeping data safe giving dashboards to partners who share data boosting Open Access getting better at harvesting and syncing data supplying clear use rules and making helpdesks and customer support stronger, in all parts of the country.

There is a gap between the growth of technical data from Indonesia OneSearch and the readiness for implementation in the field. This gap is a problem that this research is looking at. Because no comprehensive socio-technical theoretical framework for Indonesia OneSearch has been made before the main question of this study is: how can a socio-technical transformation framework that brings together the 4S dimensions is smart services, smart people, smart governance and smart place, with intelligent enhancement turn Indonesia OneSearch into an adaptive, inclusive and resilient national knowledge infrastructure?

Copyright © 2025, Muhammad Ridwan and Aam Mariyamah.

DOI: doi.org/10.33830/osc.v4i1.9332 / ISSN: 3032-2227

To answer this question this research wants to create an technical model that connects the dependability of smart technology the abilities of people the way organizations are run and the places where services are provided. The new part of this research is changing how the technology is set up in IOS. Previously it used Natural Language Processing (NLP) for looking at text and checking for plagiarism. Now it moves to a Knowledge Graph system that uses NLP. This kind of technology is added to recommendation systems and text-to-speech features in the 4S areas. It also includes the 11 ideas, from the National Library Network Roadmap 2025–2029. This change wants to make IOS into a national knowledge system.

METHOD

This research relies on a method using a literature review approach. Qualitative methods help to understand phenomena by interpreting data and the context in which the research takes place [7]. The literature review is used to find and bring together studies that are relevant, to Indonesia OneSearch (IOS) the national information ecosystem and smart libraries[8]. Also other official documents are examined to look at how institutions have developed and managed Indonesia OneSearch [9].

Data collection focuses on publications from 2020 to 2026 that are indexed in Scopus and Google Scholar databases. The literature search uses a mix of keywords like Indonesia One Search, National Knowledge Infrastructure and Smart Library. In the search stage Indonesia One Search gave 884 results National Knowledge Infrastructure gave 6,002 results and Smart Library gave 1,483 results in Scopus. Google Scholar returned about 49,100 results for Indonesia One Search, 91,600 for National Knowledge Infrastructure and 69,000, for Smart Library. The huge number of results shows that not every document can be read closely so a screening process was carried out to decide which documents fit the research focus.

The literature used in this research was chosen using clear criteria. I looked for peer-reviewed journal articles and documents from institutions that're relevant, to the national information ecosystem, smart libraries and IOS development. I did not include any sources that do not match the focus of the research that discuss technical computing aspects that are not academic publications, that are duplicates or that were published outside the research year range.

The screening process is carried out selectively by filtering titles and abstracts with relevance criteria. The results from Google Scholar, which're mostly general and outside the sociotechnical focus are not prioritized. Therefore literature from Scopus becomes the source in the selection process. As a result of this process seventeen articles that align with the research focus were obtained.

Afterwards a further examination of relevance and quality of the sources was performed. This examination resulted in twelve articles being selected as supporting sources for the research discussion.

Quality assessment is performed by considering the credibility of the sources their alignment with the research focus the clarity of the information or methods presented and their contribution to the research objectives. This approach follows Sugiyonos view that the selection and review of sources is carried out systematically by considering the suitability of the data with the research focus. According to the principles of research, context and depth of information are important aspects, in the research process[10].

Copyright © 2025, Muhammad Ridwan and Aam Mariyamah.

The 8th Open Society Conference (OSC) 2026
Faculty of Law, Social and Political Science
Universitas Terbuka
DOI: doi.org/10.33830/osc.v4i1.9332 / ISSN: 3032-2227

Data was analyzed using a method called analysis. This method involved finding themes putting them into groups comparing them and putting them all together to understand what was found in the studies and documents that were looked at [11]. The results, from this analysis were then used to find the factors that affect how IOS is developed. Based on the findings four areas of change were created. These areas are services, smart people, smart governance and smart places. Artificial intelligence is seen as a tool that helps make this whole system better.

RESULTS AND DISCUSSION

Result

This section presents the primary findings derived from the systematic literature review and document analysis concerning the strengthening of resilient library and information ecosystems through the intelligent enhancement of Indonesia OneSearch (IOS). To support these findings, Table 1 delineates the selection status and evaluation of the literature sources examined in this study.

Table 1. Literature Selection and Evaluation Matrix for Indonesia OneSearch and Smart Library Ecosystems

No	Author & Year	Tittle	Selected Status	Reason for Selection / Rejection
1	Daryono (2023)	Pemanfaatan Repository Indonesia Onesearch (IOS) untuk Pembelajaran Mahasiswa	Selected	Selected because it is relevant to support the analysis of user-side effects regarding how extensively IOS repositories are practically utilized to support student learning in higher education.
2	Lei (2021)	Design of Service Mode of Smart Library based on "Field" Synergy Theory	Selected	Selected because it supports the theoretical framework of this study in designing the synergy between physical and virtual spaces and social interactions within smart library models.
3	Liu et al. (2021)	Factors Influencing Smart Library Users' Use Intention in the Era of AI	Selected	Selected because it is crucial for examining adoption factors and user intentions toward AI-driven smart library systems amid technological disruption.
4	Xiao (2022)	Optimal Configuration of University Library Layout on Academic Literacy Based on 5G	Selected	Selected because it provides a practical framework for this study in integrating 5G/IoT infrastructure into the spatial layout of university libraries.
5	Mosha & Ngulube (2026)	Emerging Trends in Smart Libraries: A Systematic Review	Selected	Selected because it provides a macro systematic review that strengthens the analysis of sociotechnical frameworks and sustainability challenges of

Copyright © 2025, Muhammad Ridwan and Aam Mariyamah.

DOI: doi.org/10.33830/osc.v4i1.9332 / ISSN: 3032-2227

				smart libraries examined in this study.
6	Saputra et al. (2026)	When metadata is not enough: repository interoperability in a national library open-source discovery platform	Selected	Selected because it serves as a primary reference for this study in critically evaluating the IOS ecosystem, harvesting barriers, and metadata decay phenomena across repositories.
7	Verma & Allen (2022)	A Sociotechnical Readiness Level Framework for the Development of Advanced Nuclear Technologies	Selected	Selected because its methodology is adopted in this study to construct the Sociotechnical Readiness Level (SRL) framework for assessing technology adoption readiness in libraries.
8	Thomas D. Wilson (2026)	Modelling the impact of generative artificial intelligence on information behaviour research	Selected	Selected because it serves as a foundational basis for this study in portraying shifts in user information-seeking behavior driven by generative AI's role as an active intermediary.
9	Irwan et al. (2026)	Adapting the AI Readiness Index to Assess the AI Adoption Readiness of Indonesian Repositories Indexed in Indonesia One Search	Selected	Selected because it empirically measures AI adoption readiness across local repositories indexed in IOS, reinforcing the technological gap analysis in this study.
10	Alfarizi (2025)	Transformasi Strategi Smart Library Era Society 5.0 dalam Mendukung Pembangunan Berkelanjutan	Selected	Selected because it reinforces the conceptual foundation regarding smart library transformation strategies in the Society 5.0 era.
11	Hisham Shunmugam et al. (2026)	Planning the Development of Malaysia's National Knowledge Infrastructure: A Practical Case Study	Not Selected	Not selected because, although it addresses national knowledge infrastructure, its specific case study focuses on Malaysia, making it inconsistent with the empirical data and regulatory ecosystem of IOS in Indonesia.
12	Latifah (2017)	Analisis Pemanfaatan Indonesia One Search (IOS) dengan Menggunakan PIWIK	Not Selected	Not selected because its primary focus only captures historical data on the early phase of IOS utilization and dates back to 2017, making it less relevant at present.
13	Amaliah et al. (2025)	Implementation of an Integrated Information Network System Based on Indonesia One Search (IOS) in University Libraries	Selected	Selected because it supplies essential quantitative data for this study regarding the growth of collection record volumes and higher education partner institutions within IOS.

Copyright © 2025, Muhammad Ridwan and Aam Mariyamah.

DOI: doi.org/10.33830/osc.v4i1.9332 / ISSN: 3032-2227

14	Aliyyah et al. (2024)	Digital library: Lecturers' perceptions of facilitating learning resources in the industrial era 4.0	Not Selected	Not selected because its scope focuses excessively on general lecturers' perceptions of digital libraries, without touching upon the national discovery platform architecture of IOS.
15	Putra (2025)	Exploring Green Libraries Innovation toward Environmental Sustainability in Indonesia: A Systematic Review	Not Selected	Not selected because its discussion centers more on physical green building architecture, falling outside the core focus of this study.
16	Prabowo et al. (2025)	Library Decision-Making in the Digitalization Reference Services through Social Media: A Case Study of the National Library of Indonesia	Not Selected	Not selected because it specifically examines virtual reference services via social media at the National Library, lacking direct relevance to the core focus of this study.
17	Dwi Fajar Saputra (2025)	Sociotechnical Paradigm in the Study of Metadata Interoperability in Digital Libraries	Selected	Selected because it serves as a key theoretical foundation in this study to prove that metadata interoperability in IOS is not merely a technical format issue, but a sociotechnical and semantic negotiation.

(Source: Author Processed, 2026)

Based on Table 1 above the literature selection process produced a total of 17 articles that're relevant to the research topic. Of those 17 articles 12 articles were chosen as references while the remaining 5 articles were not chosen. The selected articles relate directly to the focus of the research, which is the development of Indonesia OneSearch (IOS) National Knowledge Infrastructure and Smart Library.

The choice of these articles depends on how each article supports the research variables. For example to confirm how much IOS is actually used and how its data grows this study selected articles by Daryono (2023). Amaliah et al. (2025). Next to examine the problems of metadata interoperability that often trouble IOS, the primary references come from an approach by Saputra et al. (2026). Dwi Fajar Saputra (2025). Articles by Lei (2021) Xiao (2022) Mosha & Ngulube (2026) and Alfarizi (2025) were chosen because they give a theoretical base and show trends in infrastructure for smart library transformation. Finally to gauge how ready users are to adopt technology and how that changes their behavior when artificial intelligence (AI) is present this study used findings from Liu et al. (2021) Wilson (2026) Irwan et al. (2026). The socio-technical readiness framework (SRL), by Verma & Allen (2022).

Five articles were rejected because of differences in context and scope limitations. The article by Hisham Shunmugam and others from 2026 was not used because its case study is in Malaysia. The real situation and rules cannot be matched with the IOS system in Indonesia. The article by Latifah from 2017 was also left out because its data is too old and only shows the stage of IOS, which is no longer useful for today’s fast tech changes. The other three pieces that is, the ones by Aliyyah in 2024 Putra in 2025 and Prabowo in

Copyright © 2025, Muhammad Ridwan and Aam Mariyamah.

DOI: doi.org/10.33830/osc.v4i1.9332 / ISSN: 3032-2227

2025 were rejected because they go far from what we're studying. Each of them only talks about thoughts of teachers the layout of green buildings and how to use social media for reference all of which are, outside the setting of a national metadata system. Five articles were rejected because they do not fit the scope.

Discussion

Sociotechnical Gaps in National Knowledge Infrastructure

Indonesia OneSearch (IOS) is a knowledge infrastructure that is often judged on numbers and data. The increase in metadata and the joining of universities as partners show that a lot of data has been collected [6]. This data has also been used to help students with their studies[12]. When we look closely at this system from a social and technical point of view we see that all this data collection hides bigger problems.

Studies show that there is a difference between being ready technically and being ready to use the system. Problems with collecting data, sudden inactive online collections and the loss of metadata keep happening[13]. Institutions see these issues, as technical, such as, bad servers or format mismatches. This approach leaves Indonesia OneSearch stagnated because the fixes lie in software updates and disregard the real human issues.

In fact the sustainability of a discovery platform cannot be based on technical format standards such as Dublin Core or OAI-PMH protocols. Dwi Fajar Saputra's research indicates that metadata interoperability is not about machines working together[13]. Bu it is about meaning about people, policies and institutions coming to a common understanding. When an institutional repository connects to IOS it is not enough to have a cable or network link. What is important is a policy alignment the capacity of library staff the culture in relation to data sharing and a common understanding of what the metadata stands for.

Therefore the poor integration within IOS serves as a proof of a gap not just in technical issues. The open-source technology used in IOS is very sophisticated. Yet, when examined through ways of thinking it is apparent that the ability of organizations and the readiness of people, in local places are not yet adequate[14]. This difference shows that to create a national knowledge system, the method that focuses only on technology must be stopped. To do this IOS needs to change from collecting information into a smart system by adding smart tools that can understand meaning and also using full plans that help people and organizations work together.

The Originality and Analytical Mapping of the 4S Smart Library Framework

The 4S model framework for transforming smart libraries as set out in this study did not appear suddenly. Previous models had usually given a narrow definition of smart libraries, focusing solely on the development of technology or the automation of physical facilities. The present study extends and alters this definition by adopting a broader view, one that covers the national knowledge infrastructure. What makes the 4S framework (Smart Services, Smart People, Smart Governance, and Smart Place) special in this study is its socio-technical approach and the fact that it is able to incorporate and organise the 11 strategic proposals contained in the National Library Network Roadmap for 2025–2029. Instead of seeing these four elements merely as technological features, this study presents them as strategic initiatives designed to overcome the gap between machines, regulations, and people in the IOS ecosystem.

Copyright © 2025, Muhammad Ridwan and Aam Mariyamah.

The 8th Open Society Conference (OSC) 2026
Faculty of Law, Social and Political Science
Universitas Terbuka
DOI: doi.org/10.33830/osc.v4i1.9332 / ISSN: 3032-2227

To meet the requirement for clear analysis, this study creates a detailed framework for mapping. This mapping logically outlines the synthesis process, beginning with the identification of problems in the field and moving on to the development of interventions based on the 4S framework. Table 2 below explains how the identified challenges are connected to the relevant literature, the selected 4S dimensions, the suggested solutions, and the anticipated final results.

Table 2. Analytical Mapping of the 4S Smart Library Framework in the IOS Ecosystem

Identified Challenges	Supporting Sources	4S Dimensions	Proposed Interventions	Expected Outcomes
Metadata decay and harvesting barriers across institutional repositories due to format-centric approaches.	Saputra et al. (2026); Dwi Fajar Saputra (2025)	Smart Governance	Implementing semantic negotiation and collaborative curation policies across partner institutions.	Robust metadata interoperability and a sustainable national knowledge infrastructure.
Disparities in AI readiness and dramatic shifts in user information-seeking behavior.	Irwan et al. (2026); Wilson (2026); Verma & Allen (2022)	Smart People	Conducting sociotechnical readiness training and continuous AI literacy/trust calibration programs.	Adaptive library staff and digitally literate patrons capable of utilizing AI effectively.
Information access disparities and evolving user expectations toward AI-driven systems.	Liu et al. (2021); Daryono (2023)	Smart Services	Integrating intelligent enhancements (NLP-based Knowledge Graphs, personalized recommendations).	An inclusive, highly relevant, and accessible open-source discovery platform.
Lack of synergy between physical university libraries and the virtual IOS ecosystem.	Lei (2021); Xiao (2022); Mosha & Ngulube (2026); Alfarizi (2025)	Smart Place	Configuring hybrid spatial layouts integrated with 5G and IoT (Internet of Things) infrastructure.	Sustainable and synergetic learning environments aligned with the Society 5.0 paradigm.

(Source: Author Processed, 2026)

The analytical mapping table presented above explicitly proves that each category of 4S has sufficient theoretical justification. The study does not develop solutions in the form of theoretical assumptions. The proposed recommendations were implemented from the various literature sources. In the case of Smart Governance and Smart People, the current research tackles the problem identified by Saputra et al. (2026) and Dwi Fajar Saputra (2025). The issues in data harvesting and metadata quality in this case are attributed to the lack of semantic negotiation between repositories[13][15]. The two studies suggest that collaborative governance and AI literacy calibration should be

Copyright © 2025, Muhammad Ridwan and Aam Mariyamah.

DOI: doi.org/10.33830/osc.v4i1.9332 / ISSN: 3032-2227

designed for repository managing librarians.

Due to the fact that conventional evaluation methods often overlook human resources readiness in the field, this step is vital. Empirical data from the Irwan et al. (2026) study shows that repositories included in the Indonesian OneSearch (IOS) are currently at the AI Aware level with an average score of 2.69[1]. The survey results indicate that. The AI Unaware category is still facing challenges in terms of staff acceptance and experimentation culture despite the maturity of technical aspects like metadata quality and interoperability. Verma and Allen (2022) proposed the Sociotechnical Readiness Level (SRL) framework, addressing this gap in the literature since it proves that integration challenges cannot be solved through software updates only[14]. Organizational readiness and resource availability are the main contributors to structural failure. This is to be important. As a result, librarians should balance their literacy and cultural capacity building with the use of intelligent technology such as NLP-based Knowledge Graphs.

In addition, Smart Services and Smart Place dimensions are constructed to respond to the structural change of information behavior and environmental needs. As Wilson (2026) has demonstrated, generative AI has fundamentally changed information interaction from passive document retrieving to active conversation with AI as an intermediate agent[16]. Such a change demands that national discovery systems such as IOS shed light on providing intelligent enhancements such as Knowledge Graphs and recommendation systems based on NLP to achieve task-technology fit and retain user intention[3]. In addition, the physical-virtual dichotomy of institutional repositories demands spatial re-engineering. Rooted in the field synergy theory and 5G-enabled layout optimizations, the Smart Place dimension bridges the gap between physical university libraries and the virtual IOS ecosystem[17][18]. As a result, hybrid spatial configurations of Knowledge Graphs can be seen as a critical step towards addressing information access inequalities and building an inclusive digital knowledge infrastructure for all users.

Evidence-Based Intelligent Enhancement for Resilient Ecosystems

This research posits intelligent enhancement not only as an additional feature of sweetening technology but also as a solution to specific problems in the IOS. Every technology innovation proposed in the 4S has strong empirical basis from the literature.

The first is the use of Knowledge Graph based on NLP in the dimension Smart Governance to address the crisis of metadata interoperability. As per the findings of Saputra, Asmiyanto and Mayesti and D. F. Saputra, libraries currently experience the phenomena of metadata decay and require semantic negotiation between institutions urgently [13][19]. Practically, Knowledge Graph acts as an automatic semantic bridge to map the relationships of meaning of millions of fragmented data in the IOS, enabling this platform transform from a passive search engine towards a connected knowledge network.

Second, the use of recommendation systems in the Smart Services dimension is justified by the changing nature of information seeking behavior. According to Wilson's (2026) recent information behavior paradigm, artificial intelligence has transformed the way users interact with information, which impacts their information seeking and usage[16]. In particular, users shift from passive information seeking to active ones,

Copyright © 2025, Muhammad Ridwan and Aam Mariyamah.

DOI: doi.org/10.33830/osc.v4i1.9332 / ISSN: 3032-2227

where they rely on recommendation systems to combine the information and present it in a particular form that answers their queries directly. Such a transformation creates two challenges for information service design. First, the source of information becomes less transparent (more veiled). Second, there are higher expectations from the systems. In particular, the TTF (Task-Technology Fit) model by Liu et al. (2021) highlights that in the case of national discovery systems, such as Indonesia OneSearch (IOS), the fit between technology and tasks should be close to recommendatory, where recommendations become integral parts of the system[3]. Such a fit addresses both challenges of information source transparency and rising expectations, as well as promotes user trust and prevents users from turning to commercial discovery services.

Thirdly the reinforcement of Smart People and Smart Services happens at the time by improving artificial intelligence literacy and by giving advanced accessibility, such as text-to-speech. Regarding the ecosystem national digital transformation can create a digital divide if the development focuses only on the sophistication of machine infrastructure and does not prepare users' capabilities[1][14]. The design of Smart Library services needs a balance of literacy and accessibility that is friendly for all members of society including vulnerable groups to reduce disparities in technology adoption readiness in various regions[2]. Hence accessibility features and programs for improving librarian literacy will not be an add-on; instead they are critical instruments to guarantee that epistemic justice and access, to national knowledge can be enjoyed equally and leave no one behind in the technological disruption era.

Fourth the Smart Place aspect is carefully put together to remove the split between the libraries of partner organizations and the IOS virtual world. Thinking about Leis field synergy theory library areas should be created as a mix of digital places that brings together people, materials and the surroundings using services that change based on situations[17]. Improving these places is made stronger, by the help of 5G networks and the Internet of Things (IoT) as shown by Xiao, which makes it possible to have digital links and almost no delay to meet what users need right away[18]. With this Smart Place setup local libraries do more than just act as fixed online entrances. They become places where people can talk and work together matching the Society 5.0 idea.

CONCLUSION

The study concludes that although Indonesia OneSearch (IOS) has made significant progress in terms of data gathering as a knowledge system, its success is hampered by multifaceted issues that are related to people and technology. In particular, the fact that information gathering in IOS is challenging and that the data that the system provides is often outdated indicates that the solution to the problem is not necessarily in technological advancement. Instead, the issue stems from people and their ability to collaborate, share information, and develop a more integrated environment in which IOS would be able to thrive. Thus, the study indicates that the improvement of IOS requires not only hardware and software but also people who are capable of multi-faceted collaboration.

As part of the theory and suggestions of this study the vision of turning the system into a library is presented. This vision is based on four pillars: Smart Services, Smart People, Smart Governance and Smart Place. The vision includes using solutions based on a Knowledge Graph that is built on Natural Language Processing. These solutions are

Copyright © 2025, Muhammad Ridwan and Aam Mariyamah.

DOI: doi.org/10.33830/osc.v4i1.9332 / ISSN: 3032-2227

designed to resolve the issues of data and offer suggestions to the users. The vision also includes adding speech-to-text functions to increase the accessibility of the system. The goal is to make knowledge more accessible to an audience. The goal is to change the approach that IOS should take. The approach should change from being a storage facility to a system that supports the country.

Based on the findings of this study there are opportunities for research. For example an opportunity exists to test the plan in practice. For example looking at how the NLP-based Knowledge Graphs work on the IOS network. Also looking at how these Knowledge Graphs help in understanding data. Moreover there is a need for further studies to explore how to help the librarians learn more about AI. One of the areas is to monitor how peoples habits change when they use recommendation systems, on the IOS platform.

DECLARATION OF GENERATIVE AI

In the process of preparing this paper, the Author relied on ChatGPT (OpenAI), Claude, and Gemini to improve language and grammar. The Author then reviewed and revised the resulting content as needed and takes full responsibility for the content of the publication.

REFERENCES

[1] S. I. Irwan, E. Rizal, N. A. Damayani, and A. Rusmana, "Adapting the AI Readiness Index to Assess the AI Adoption Readiness of Indonesian Repositories Indexed in Indonesia One Search," *DESIDOC J. Libr. Inf. Technol.*, vol. 46, no. 4, pp. 408–418, Jul. 2026, doi: 10.14429/djlit.21906.

[2] M. Alfarizi, "Transformasi Strategi Smart Library Era Society 5.0 dalam Mendukung Pembangunan Berkelanjutan:," *Media Pustak.*, vol. 32, no. 2, pp. 186–200, Aug. 2025, doi: 10.37014/medpus.v32i2.5545.

[3] J. Liu, D. Song, and W. Li, "Research on Factors Influencing Smart Library Users' Use Intention in the Era of Artificial Intelligence," *J. Phys. Conf. Ser.*, vol. 2025, no. 1, p. 012089, Sep. 2021, doi: 10.1088/1742-6596/2025/1/012089.

[4] R. Hisham Shunmugam, Z. Saupi Udin, N. Abdullah, A. Fauzi, and S. H. Saleh, "Planning the Development of Malaysia's National Knowledge Infrastructure: A Practical Case Study," 2026, pp. 278–290. doi: 10.1007/978-981-95-4861-3_24.

[5] U. Latifah, "Analisis Pemanfaatan Indonesia One Search (IOS) dengan Menggunakan PIWIK," UIN Syarif Hidayatullah, 2017.

[6] Eni Amaliah, A. Lufti, and N. Fadila, "Implementation of an Integrated Information Network System Based on Indonesia One Search (IOS) in University Libraries," *J. El-Pustaka*, vol. 6, no. 1, pp. 24–37, Jun. 2025, doi: 10.24042/el-pustaka.v6i1.27580.

[7] R. K. Yin, *Case study research and applications: Design and methods*. Los Angeles, 2018.

[8] H. Snyder, "Literature review as a research methodology: An overview and guidelines," *J. Bus. Res.*, vol. 104, pp. 333–339, Nov. 2019, doi: 10.1016/j.jbusres.2019.07.039.

[9] G. A. Bowen, "Document Analysis as a Qualitative Research Method," *Qual. Res. J.*, vol. 9, no. 2, pp. 27–40, Aug. 2009, doi: 10.3316/QRJ0902027.

[10] Sugiyono, *Metode Penelitian Kuantitatif, Kualitatif dan R&D*. Bandung: ALFABETA, CV, 2020.

[11] V. Braun and V. Clarke, "Using thematic analysis in psychology," *Qual. Res. Psychol.*, vol. 3, no. 2, pp. 77–101, Jan. 2006, doi: 10.1191/1478088706qp063oa.

[12] Daryono, "Pemanfaatan repository indonesia onesearch (ios) sebagai kebutuhan informasi untuk pembelajaran bagi mahasiswa universitas bengkulu," *JAPRIJurnal Perpust. dan Inf.*,

Copyright © 2025, Muhammad Ridwan and Aam Mariyamah.

DOI: doi.org/10.33830/osc.v4i1.9332 / ISSN: 3032-2227

vol. 5, no. 1, pp. 20–28, 2023.
[13] D. F. Saputra, "Peran Metadata Crosswalk dalam Web-Scale Discovery Service : Perbandingan Lima Sistem Sumber dalam Indonesia One Search," *Maktab. J. Kaji. Kepustakawanan*, vol. 8, no. 1, pp. 137–151, 2026.
[14] A. Verma and T. Allen, "A Sociotechnical Readiness Level Framework for the Development of Advanced Nuclear Technologies".
[15] D. F. Saputra, "Sociotechnical Paradigm in the Study of Metadata Interoperability in Digital Libraries," vol. 26, no. 4, pp. 1–7, 2025, doi: 10.21070/ijins.v26i4.1485.
[16] T. D. Wilson, "Modelling the impact of generative artificial intelligence on information behaviour research," 2026, doi: 10.1108/JD-03-2026-0150.
[17] S. Lei, "Design of Service Mode of Smart Library based on 'Field' Synergy Theory," *J. Phys. Conf. Ser.*, vol. 1992, no. 4, p. 042045, Aug. 2021, doi: 10.1088/1742-6596/1992/4/042045.
[18] J. Xiao, "Research on the Impact of Optimal Configuration of University Library Layout on Students' Academic Literacy Development Based on 5G," *Math. Probl. Eng.*, vol. 2022, pp. 1–10, Sep. 2022, doi: 10.1155/2022/9865838.
[19] D. F. Saputra, T. Asmiyanto, and N. Mayesti, "When metadata is not enough," *Scire Represent. y Organ. del Conoc.*, vol. 32, no. 1, pp. 25–36, Jun. 2026, doi: 10.54886/scire.v32i1.5141.

Copyright © 2025, Muhammad Ridwan and Aam Mariyamah.