



LIBRARY INNOVATIONS IN THE DIGITALIZATION ERA: A SYSTEMATIC REVIEW

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ABSTRACT

This research presents a systematic review of trends and innovations in the library sector during the era of digitalization. As technology has advanced, libraries have transformed from traditional print-based service providers to dynamic digital platforms. This article explores several key aspects, including the nature of innovation in libraries, the challenges faced in implementing these innovations, their impacts, and recommendations for future practices. The study is based on a comprehensive analysis of literature sourced from Google Scholar, encompassing a review of 1,000 articles. The findings underscore the necessity of ongoing government support and the active involvement of community members in fostering successful innovation in libraries. Furthermore, this study offers valuable insights and recommendations for future research, emphasizing the critical role libraries play in promoting access to information and enhancing community engagement in a rapidly evolving digital landscape.

INTRODUCTION

Technological advances have encouraged the development of various sciences, including library science. This development has encouraged the transformation of libraries into digital information centres, which are no longer limited to providing access to print collections only but also present various electronic resources and innovative services for their users. This raises challenges, namely how technology can be optimally utilized to improve the quality of library services while remaining relevant to its users

(Lestyaningrum et al., 2022; Sari et al., 2023). In this case, library digitization is not just about converting print media into digital media but also about applying innovation in library interactions, operations, and services.

The role of librarians in ensuring that libraries can keep up with technological developments is crucial. Librarians are not only tasked with storing and providing information; they must also be aware of the latest innovations in library science and implement them. In addition, librarians must also be able to bridge the gap between available technology and user needs (Atmoko & Suprihatin, 2023; Qurbi, 2024). Therefore, librarians must understand innovations in library science to maintain libraries' relevance in the digital era.

Some innovations in library science involve using new technologies, such as artificial intelligence (AI), digital library development, and big data. In addition, libraries also serve as centres of creativity and innovation, providing collaborative spaces such as maker spaces and advanced technology tools that allow communities to conduct research and development together. However, implementing these innovations has not always gone smoothly, especially in libraries with limited infrastructure and resources (Ashiq et al., 2021; Barsha & Munshi, 2023). Another challenge is resistance to change, where some librarians and users feel more comfortable with traditional ways. In addition, limited funding is another obstacle for libraries. Therefore, not all libraries have implemented these innovations.

Therefore, this research aims to examine innovations in libraries systematically. The discussion includes innovations in library science, examining the challenges and impacts of their implementation. It is expected to provide recommendations for libraries in the future. Thus, this research not only closes the gap in the existing literature but also offers relevant and globally applicable solutions.

METHODS

The method used in this research is a Systematic Literature Review (SLR) with a prism model. The SLR method aims to collect scientific information from various documented sources, such as books, journals, records, historical records, and other documents available in libraries, both digital and print. These literature sources can be theories, methods, or approaches that have been developed and documented (Hadi &

Afandi, 2021; Suhartono, 2017). Therefore, this SLR method can also avoid repetition, imitation, and plagiarism of research. In addition, this SLR method can show the development of a science.

Preparing a literature review includes six stages: determining the topic, searching for related literature, developing arguments, conducting a survey of relevant literature, criticizing the literature, and writing the review (Dewi & Sahrina, 2021; Hadi & Afandi, 2021; Suhartono, 2017). A literature review should not only contain a bibliography but should also present a critical analysis of the various references used. This aims to provide depth and affirmation of the specific characteristics of the research. The literature search process uses the keywords *inovasi perpustakaan*, *innovative library*, and *Library innovation*. The data retrieved were articles within five years (2020-2024) using PoP with data sources from Google Scholar, and 177,236 articles were obtained. Data download was carried out on 10 October 2024. The articles were then sorted and taken from journals only and by the theme of the discussion, so that 57 articles were obtained. The inclusion and exclusion criteria of the articles are presented in Table 1, and the research stages are presented in Figure 1.

Table 1. Inclusion and exclusion of articles

Inclusion	Exclusion
Article 2020-2024	Article beyond 2020-2024
Journal article	Proceedings articles, books, and other sources
Articles from google scholar data	Article not detected by Google Scholar
Article topics related to innovation, challenges, and impact in the library field	Articles on topics other than innovation, challenges, and impact in the library field
Inclusion	Exclusion

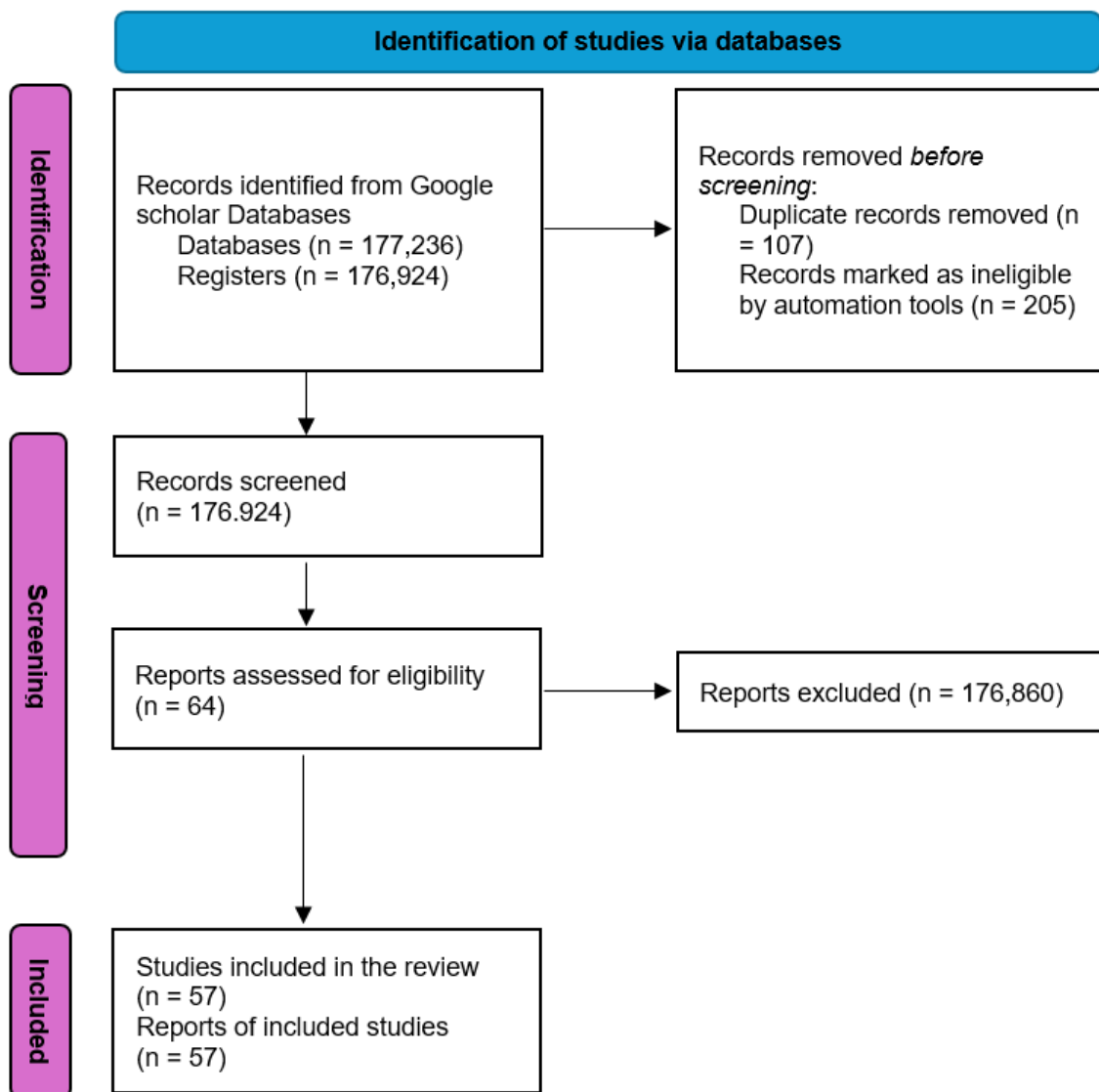


Figure 1. Research Stages

RESULTS AND DISCUSSION

Innovations in Library

The integration of technology, such as artificial intelligence, has accelerated the development of innovation in libraries. Some processes in libraries that were previously done manually, thus requiring more time, can be done practically using AI (Cox, 2023; Haffenden et al., 2023). These processes include cataloging and information retrieval (Fabrienne, 2023; Fitriyadi & Maulidi, 2020). AI systems also produce search analysis for each user with more personalized results (Haleem et al., 2022; Shin, 2020; Yoganarasimhan, 2020). In addition, libraries can provide 24-hour per day services to users by utilizing AI-based chatbots and virtual assistants. With the utilization of this

technology, simple questions and information searches can be done anywhere and anytime, without waiting for librarian assistance. Research by Barsha and Munshi (2023), Lund et al. (2020), and Okunlaya et al. (2022) show that the use of AI in libraries, in addition to speeding up the information search process, also increases the accuracy of search results.

In addition, modern libraries have started to adopt the concept of "green libraries" as part of sustainability efforts (Fedorowicz-Kruszewska, 2021; Gupta, 2020; Lokhande, 2022; Mochammad et al., 2020; Mwanzu et al., 2023; Şeşen & Kuzucuoglu, 2020; Shukla et al., 2020). These innovations include implementing environmentally friendly infrastructure, such as using renewable energy, reducing paper use, and supporting energy-efficient buildings. Libraries are also promoting the use of digital resources as a way to reduce the environmental impact caused by the use of printed materials. E-books, electronic journals, and digital repositories allow users to access information without having to print, reducing waste and saving library operating costs. Even research by Garoufali and Garoufallou (2024) showed that libraries that implement environmentally friendly practices tend to get more support from the community.

In addition, libraries are no longer just places to store and borrow books but have evolved into collaborative spaces that support community innovation and creativity (Hapel, 2020; Hernández-Pérez et al., 2022; Nur et al., 2024; Palmer, 2022). Libraries now provide maker spaces and learning labs, where users can learn to use advanced technologies such as 3D printers, design software, and other tools for creative and research projects. These maker spaces encourage collaboration between users from different backgrounds, providing opportunities to share ideas and knowledge, and create innovative solutions (Swandari & Jemani, 2023). These creative hubs also position themselves as research and innovation hubs, where users can access research resources, collaborate with academic peers, and utilize the latest technology to support their research (Brantasari et al., 2024; Das & Banerjee, 2021; Leebaw & Tomlinson, 2020; O'Donnell & Anderson, 2022). Thus, libraries that offer collaborative spaces are able to attract a wider community, from students to entrepreneurs, who utilize library facilities for the development of shared ideas and research. The library's role as a

community center strengthens its social function in society, enabling it to remain relevant amidst technological and cultural changes.

Challenges in Implementing Innovations

One of the main challenges in implementing innovations in libraries is financial and budgetary constraints (Ashiq et al., 2021; Barsha & Munshi, 2023; Sitorus et al., 2024; Suchá et al., 2021). Innovations, especially those involving new technologies such as artificial intelligence, big data, and digital platforms, require large initial investments. The cost of procuring hardware, software and staff training is often a constraint for libraries, especially in developing countries. In addition, many libraries rely on limited government funding or external funding sources, which are often insufficient to support the full implementation of new technologies.

In addition to financial constraints, resistance to change among library staff and users is also an obstacle in the innovation process (Ahyani & Dhuhani, 2024; Aisyah et al., 2024; Khosyiin & Khoiri, 2024; Munir & Su'ada, 2024; Suchá et al., 2021). Many librarians who are used to traditional methods find it difficult to adapt to new technologies. There is a skills gap that needs to be addressed through staff training and development so that they can operate digital systems and AI-based services effectively. On the other hand, library users, especially those who have been using conventional library services for a long time, may show resistance to new digital services. They feel comfortable with the old ways and are reluctant to learn new technologies such as online catalogs or digital book lending.

Another challenge is that digital technology requires infrastructure related to cybersecurity (Aji, 2023). Libraries that adopt digital platforms and internet-based services eventually also need reliable technological infrastructure, including strong internet networks and secure data storage systems. However, not all libraries, especially in rural areas or developing countries, have sufficient access to this infrastructure. Digital libraries also face high cybersecurity risks, such as data theft and hacker attacks.

It is also very important for libraries to ensure reliable access to their digital resources. Users often experience difficulties in accessing digital materials due to technical issues, such as servers going down or unresponsive library applications. Reliance on digital technology adds to these challenges, where infrastructure limitations,

both in terms of technology and technical support, can hinder widespread use of digital services. These issues require libraries to invest not only in technology, but also in ensuring continued access and user-friendliness to digitally-provided resources.

Assessment of Impacts

Innovations in library science have had a significant impact on the use of libraries by the public. By implementing new technologies and digital services, libraries have improved access and convenience for users. Users can now access digital collections, including e-books and online databases, anytime and anywhere. Greater access to digital resources has led to a significant increase in the number of loans and use of library services (Al-Insyirah et al., 2024; Aqmilannaja et al., 2024; Baharuddin & Rosman, 2020; Nabila et al., 2024). With more accessible services, libraries serve as a bridge that connects people to important information, especially for those who may not have access to information resources elsewhere. In addition, these innovations help bridge the digital divide, with many libraries providing technology training and free internet access to disadvantaged communities (Endarti, 2022; Maharani, 2022).

From an economic perspective, the adoption of innovation in libraries has also shown a positive impact. Through cost-benefit analysis, many libraries have found that investments in digital services and new technologies often pay off with increased usage and operational efficiency. For example, the use of more sophisticated library management systems can reduce the time and cost required for collection management (Ardiansyah & Permana, 2024; Sopwandin, 2021; Suharti, 2024; Yusuf, 2024). In addition, innovative projects that are well supported tend to have long-term sustainability, contributing to the financial stability of the library. Libraries that invest in new technologies and digital initiatives tend to attract more funding from external sources, including grants and sponsorships, which strengthen their business models and support innovative projects (Waidlein et al., 2021).

The social impact of library innovation is also very important, especially in terms of user engagement and social change. Libraries have evolved into community hubs that not only provide information resources but also support education and training programs (Garoufali & Garoufallou, 2024; Kurniasih & Saefullah, 2021; Tarigan & Batubara, 2023). As catalysts for social change, libraries play a key role in facilitating

access to education for the wider community. Initiatives such as literacy programs and digital skills seminars have helped empower individuals and increase community participation in social and educational activities (Kirana et al., 2024; Marieska et al., 2024; Putri et al., 2024). In addition, libraries serve as lifelong learning spaces, where users can continuously develop their skills and knowledge, contributing to lifelong learning and capacity building in their communities.

Future Directions and Recommendations

In the face of new challenges and opportunities in library science, there are several research gaps that need to be filled to encourage further development. First, there is an urgent need to explore new emerging technologies in library science. Technologies such as artificial intelligence, blockchain and big data analytics can transform the way libraries operate and serve users. Further research is needed to understand how these technologies can be effectively integrated into library services and to explore the social and ethical impacts of their adoption (Sari et al., 2023). In addition, sustainable library practices in developing countries also need more attention. Many libraries in these countries face major challenges in terms of resources and infrastructure, and research focusing on innovation models appropriate to the local context can provide valuable insights into ways to achieve sustainability in library services (Hernández-Pérez et al., 2022; Mathiasson & Jochumsen, 2022).

From a policy standpoint, government support is essential to facilitate innovation in libraries. The government should increase funding for innovative library projects and provide incentives for libraries to adopt new technologies. This includes the provision of grants and training programs designed to help librarians and library staff develop the necessary skills to manage and use new technologies. In addition, international cooperation in library science needs to be strengthened. Through the exchange of knowledge and best practices between libraries in different countries, libraries can better address global challenges and share innovative solutions that have proven effective (Barsha & Munshi, 2023; Destrianto et al., 2023; Rodin et al., 2023).

Strategies for public engagement and awareness of library services are also important to optimize the impact of innovations. Campaigns to promote digital literacy can help people understand and utilize the digital resources available in libraries. This

includes not only training on how to use technology, but also education on the importance of valid and reliable information in an era of information abundance. In addition, engaging the community in library innovation through participation in the planning and development of new services can increase ownership and support the sustainability of library programs.

Finally, collaboration opportunities for library stakeholders have the potential to strengthen innovation. Partnerships with educational institutions and technology companies can create beneficial synergies, allowing libraries to access the resources and expertise needed to implement innovations. In addition, collaborative networks for sharing best practices can accelerate the process of innovation adoption in libraries around the world, allowing them to learn from each other's experiences and create more effective solutions to the challenges they face.

CONCLUSION

Innovation in libraries has significantly changed how they operate and serve users in the digital age. Technologies like artificial intelligence, digital libraries, and collaborative spaces have turned traditional libraries into vibrant centers for creativity, research, and development. These advancements not only engage users more effectively but also encourage collaboration and sharing of knowledge. However, implementing these innovations comes with challenges, such as limited budgets, resistance to change from both staff and patrons, and the need for reliable technology infrastructure. Despite these obstacles, the positive effects of innovation are clear. Libraries have become more accessible, efficient, and relevant in today's rapidly changing world. By embracing these changes, libraries can better meet the diverse needs of their communities and play a vital role in promoting lifelong learning and digital literacy.

REFERENCES

- Ahyani, E., & Dhuhani, E. M. (2024). Digital Transformation in Education Office Management: A Literature Review. *Visionary Journal: Research and Development in Educational Administration*, 12(1), 205-215.
- Aisyah, N., Khotima, H., & Ismail, F. (2024). Innovation in educational organization. *AL-MUADDIB: Journal of Educational Science Studies*, 6(3), 665-678.

- Aji, M. P. (2023). Cyber Security System and Data Sovereignty in Indonesia in Political Economic Perspective (Case Study of Personal Data Protection). *Journal of Political Dynamics of Domestic Political Issues and International Relations*, 13(2), 222-238.
- Al-Insyirah, A., Maryati, M., & Munafiah, N. (2024). Library Service Management at SDIT Hasanah Fathimiyah Cikarang. *Indonesian Research Journal on Education*, 4(2), 108-113.
- Aqmilannaja, A. U., Wafirah, M., & Hasyim, A. F. (2024). Evaluation of Library Service Quality Using SLiMS Application at SMK Syubbanul Wathon Secang: Evaluation of Library Service Quality Using SLiMS Application at SMK Syubbanul Wathon Secang. *Edu Cendikia: Scientific Journal of Education*, 4(02), 614-630.
- Ardiansyah, F., & Permana, I. S. (2024). The effectiveness of library management implementation using Senayan Library Management System (SLiMS) at the East Indonesia University Library. *Literatify: Trends in Library Developments*, 5(1), 45-59.
- Ashiq, M., Rehman, S. U., & Mujtaba, G. (2021). Future challenges and emerging role of academic libraries in Pakistan: A phenomenology approach. *Information Development*, 37(1), 158-173.
- Atmoko, P. W., & Suprihatin, E. S. (2023). Implementation of AI (Artificial Intelligence) technology in supporting the duties of academic libraries to transform digital library through chatgpt opening. *Building a Digital Ecosystem (Library Transformation Supports)*.
- Baharuddin, N. S., & Rosman, M. R. M. (2020). Factors affecting the usage of Library e-services in the aftermath of COVID-19 Pandemic. *Academic Journal of Business and Social Sciences*, 4(1), 1-14.
- Barsha, S., & Munshi, S. A. (2023). Implementing artificial intelligence in library services: A review of current prospects and challenges of developing countries. *Library Hi Tech News*, 41(1), 7-10.
- Brantasari, M., Ananta, A., Anggraeni, A., & Hanim, Z. (2024). Strategic Planning of Educational Institution Resources in Practice at the PBI Study Program UWGM Samarinda. *Pendas Mahakam: Journal of Elementary School Education and Learning*, 9(2), 110-117.
- Cordell, R. (2020). Machine learning + libraries. *Library of Congress, Washington, DC*

- <https://Labs.Loc.Gov/Static/Labs/Work/Reports/Cordell-LOC-ML-Report.Pdf>.
- Cox, A. (2023). How artificial intelligence might change academic library work: Applying the competencies literature and the theory of the professions. *Journal of the Association for Information Science and Technology*, 74(3), 367-380.
- Das, A., & Banerjee, S. (2021). Optimizing research support services through libraries: A review of practices. *Library Philosophy and Practice*, 1-43.
- Destrianto, M. R., Iskandar, F. A., Ariotejo, I. B., Aprilisa, F. C. D., & Utomo, N. C. (2023). *JagaPerpus.org: A Digital Repository Portal for Indonesian Library and Librarianship Heritage*.
- Dewi, K., & Sahrina, A. (2021). The urgency of augmented reality as a medium of learning innovation in preserving culture. *Journal of Integration and Harmony of Innovative Social Sciences (JIHIS)*, 1(10), 1077-1089.
- Endarti, S. (2022). Library as a place of information recreation. *ABDI PUSTAKA: Journal of Library and Archives*, 2(1), 23-28.
- Fabrienne, A. F. (2023). The Use of Letter Archive Management Information System (SIPAS 8) in Finding Active Archives at SMK Negeri 8 Semarang. *Information Science and Library*, 4(1), 18-29.
- Fedorowicz-Kruszewska, M. (2021). Green libraries and green librarianship-Towards conceptualization. *Journal of Librarianship and Information Science*, 53(4), 645-654.
- Fitriyadi, F., & Maulidi, M. (2020). STMIK Banjarbaru Library Visitor Recording Model Using Microcontroller-Based RFID. *Progressive: Journal of Computer Science*, 16(2), 103-112.
- Garoufali, A., & Garoufallou, E. (2024). Transforming libraries into learning collaborative hubs: The current state of physical spaces and the perceptions of Greek librarians regarding the implementation of the "Learning Commons" model. *Global Knowledge, Memory and Communication*, 73(6/7), 828-852.
- Gupta, S. (2020). Green library: A strategic approach to environmental sustainability. *International Journal of Information Studies and Libraries*, 5(2).
- Hadi, N. F., & Afandi, N. K. (2021). Literature Review is A Part of Research. *Sultra Educational Journal*, 1(3), 64-71.
- Haffenden, C., Fano, E., Malmsten, M., & Börjeson, L. (2023). Making and using AI in the

- library: creating a BERT model at the national library of Sweden. *College & Research Libraries*, 84(1).
- Haleem, A., Javaid, M., Qadri, M. A., Singh, R. P., & Suman, R. (2022). Artificial intelligence (AI) applications for marketing: A literature-based study. *International Journal of Intelligent Networks*, 3, 119-132.
- Hapel, R. (2020). Building a contemporary public library through community engagement: A personal journey. *Public Library Quarterly*, 39(5), 391-409.
- Hernández-Pérez, O., Vilariño, F., & Domènech, M. (2022). Public libraries engaging communities through technology and innovation: Insights from the library living lab. *Public Library Quarterly*, 41(1), 17-42.
- Jamridafrizal, J., Zulfitri, Z., & Wajdi, M. F. (2024). *Library as an Institution of Organizational and Regulatory Perspectives*. Laksita Indonesia Foundation.
- Khosyiin, M. I., & Khoiiri, M. Y. (2024). Application of Digital Technology in Improving Learning Effectiveness in Islamic Education. *Sasana: Journal of Islamic Education*, 3(1), 137-142.
- Kirana, A. N., Lestari, E. P., & Rachman, I. F. (2024). Improving digital literacy through government, private sector, and community collaboration: a contribution to the achievement of SDGS 2030 in education. *MERDEKA: Multidisciplinary Scientific Journal*, 1(5), 1-8.
- Kurniasih, R. I., & Saefullah, R. S. (2021). Social Inclusion as a Service Transformation in Karanganyar Regional Library. *Journal of Library Science Studies*, 7(2), 149-160.
- Leebaw, D., & Tomlinson, C. (2020). What Do You Get When You Mix Libraries and Entrepreneurship? The Case of an Innovation Hub at a Large Research Library. *Library Leadership & Management*, 34(4).
- Lestyningrum, I. K. M., Trisiana, A., Safitri, D. A., & Pratama, A. Y. (2022). *Digital technology-based global education in the millennial era*. Unisri Press.
- Lokhande, R. S. (2022). Green Library: Sustainable Development. *International Journal of Reviews and Research in Social Sciences*, 10(3), 107-110.
- Lund, B. D., Omame, I., Tijani, S., & Agbaji, D. (2020). Perceptions toward artificial intelligence among academic library employees and alignment with the diffusion of innovations' adopter categories. *College & Research Libraries*, 81(5), 865.
- Maharani, A. (2022). Factors Driving Interest in Student Visits to the National Library.

- BIBLIOTICS: Journal of Library and Information Studies*, 6(2), 179.
- Marieska, N. V., Mukhlis, A., & Rachman, I. F. (2024). Innovation transformation in improving digital literacy to achieve the 2030 sustainable development goals. *MERDEKA: Multidisciplinary Scientific Journal*, 1(5), 290-298.
- Mathiasson, M. H., & Jochumsen, H. (2022). Libraries, sustainability and sustainable development: a review of the research literature. *Journal of Documentation*, 78(6), 1278-1304.
- Mathuews, K. B., & Harper, D. J. (2020). *Academic Library Makerspaces: A Practical Guide to Planning, Collaborating, and Supporting Campus Innovation*. Bloomsbury Publishing USA.
- Mochammad, R., Ardika, R., & Cahyono, T. Y. (2020). Library 4.0: Eco-Blended Library and Library Inclusion. *Khizanah Al-Hikmah: Journal of Library, Information, and Archival Sciences*, 8(2), 116-129.
- Munir, M., & Su'ada, I. Z. (2024). Islamic Education Management in the Digital Age: Transformation and Challenges of Educational Technology Implementation. *JIEM: Journal of Islamic Education and Management*, 5(1), 1-13.
- Mwanzu, A., Bosire-Ogechi, E., & Odero, D. (2023). Green initiatives towards environmental sustainability: Insights from libraries in Kenya. *IFLA Journal*, 49(2), 298-314.
- Nabila, J., Primadesi, Y., & Akbar, L. H. (2024). Optimization of Reading Corner Services at the Andalas University Library: Increasing Student Interest in Visiting. *Anuva: Journal of Culture, Library, and Information Studies*, 8(2), 303-311.
- Nur, R., Ibrahim, A., & Mulyadi, I. (2024). Analysis of the implementation of social inclusion-based library transformation in the library and archives office of the southern sulawesi province in collaboration with the literacy activist community. *Journal Papyrus: Social, Humanities, Library and Information*, 3(6), 38-51.
- ODonnell, P., & Anderson, L. (2022). The university library: Places for possibility. *New Review of Academic Librarianship*, 28(3), 232-255.
- Okunlaya, R. O., Syed Abdullah, N., & Alias, R. A. (2022). Artificial intelligence (AI) library services innovative conceptual framework for the digital transformation of university education. *Library Hi Tech*, 40(6), 1869-1892.
- Palmer, M. (2022). Study of future public library trends & best practices. *Public Library*

Quarterly, 41(1), 83-107.

- Putri, N. M., Listiawati, W., & Rachman, I. F. (2024). The influence of digital literacy on community empowerment in the context of SDGS 2030. *Journal of Indonesian Education Research (JPPI)*, 1(3), 349-360.
- Qurbi, G. (2024). "Social Inclusion Program as a Transformation of Library Services at the West Sumatra Provincial Library and Archives Office". Faculty of Language and Arts.
- Rodin, R., Novalia, M., Rosalina, V., & Himatujaria, L. (2023). Policy for developing and improving the quality of archival human resources at the Regional Library and Archives Office of Rejang Lebong Regency. *Al-Kuttab: Journal of Library, Information and Archives Studies*, 5(2), 22-43.
- Sari, K. P., Masruri, A., & Rosalia, D. R. (2023). Optimizing information retrieval with artificial intelligence technology in libraries. *JIPi (Journal of Library and Information Science)*, 8(2), 349-366.
- Şeşen, Y., & Kuzucuoglu, A. H. (2020). The importance of green libraries in terms of sustainability. *Journal of Balkan Libraries Union*, 7(1), 10-16.
- Shin, D. (2020). User perceptions of algorithmic decisions in the personalized AI system: Perceptual evaluation of fairness, accountability, transparency, and explainability. *Journal of Broadcasting & Electronic Media*, 64(4), 541-565.
- Shukla, R., Sharma, A., & Singh, M. (2020). Sustainability development of green libraries and its features, importance, and standards. *International Journal of Information Dissemination and Technology*, 10(4), 219-226.
- Sitorus, E. R. B., Widiayati, W., Nurdiansari, N., Nurlalawati, N., & Haryaka, U. (2024). Policy Analysis of Junior High School Education Financing in Indonesia: Challenges and Strategies. *Pendas Mahakam: Journal of Primary School Education and Learning*, 9(2), 73-84.
- Sopwandin, I. (2021). *Higher Education Library Management*. Guepedia.
- Suchá, L. Z., Bartošová, E., Novotný, R., Svitáková, J. B., Štefek, T., & Víchová, E. (2021). Stimulators and barriers towards social innovations in public libraries: Qualitative research study. *Library & Information Science Research*, 43(1), 101068.
- Suharti, A. D. (2024). Digitizing Collections to Facilitate Information Access at the Directorate of Library UII. *Library Bulletin*, 7(1), 123-137.
- Suhartono, E. (2017). Systematic Literature Review (SLR): Methods, Benefits, and

- Challenges of Learning Analytics with Data Mining Methods in Higher Education. *INFOKAM Scientific Journal*, 13(1).
- Swandari, N., & Jemani, A. (2023). Soft Skill Development of Learners through a Social Inclusion-Based Library (Study at Madrasah Tsanawiyah Negeri 3 Jombang). *LITERATION: Journal of Indonesian Teacher Education*, 2(2), 127-147.
- Tarigan, T. B., & Batubara, A. K. (2023). The Role of Karo Regency Regional Library in Utilizing the Social Inclusion Literacy Program. *Munaddhomah: Journal of Islamic Education Management*, 4(2), 441-450.
- Waidlein, N., Wrzesinski, M., Dubois, F., & Katzenbach, C. (2021). *Working with budgets and funding options to make open access journals sustainable*. HIIG Discussion Paper Series.
- Yoganarasimhan, H. (2020). Search personalization using machine learning. *Management Science*, 66(3), 1045-1070.
- Yusuf, M. (2024). The Role of Artificial Intelligence (AI) as a Supporter of Library Automation. *Pustakaloka*, 16(1), 41-57.