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# The 15th Asian Conference on Education

November 22–25, 2023 | Held in Tokyo, Japan & Online

ISSN: 2186-5892

Official  
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The Asian Conference on Education 2023

Official Conference Proceedings

ISSN: 2186-5892



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Sakae 1-16-26-201  
Naka Ward, Nagoya, Aichi  
Japan 460-0008  
[www.iafor.org](http://www.iafor.org)

- The Implication of Subconscious Approach in Stimulating the English Language Knowledge for Interpreting-Majored Students*  
Nhi Yen Ho pp. 751 - 762
- Do Prior Knowledge of Advanced Mathematics Influence Academic Confidence of Students Taking Pre-university Chemistry Courses*  
Raymond Hee Kok Keong pp. 763 - 780
- Diversity and Interesting: International Students' Perception of Chinese Video Programs to Supplement Cultural Teaching*  
Mengru Huang  
Tiewa Cao pp. 781 - 791
- Using Team-Based Learning for Post-graduate Training: Challenges and Solutions*  
Luan Nhut Au  
My Thi Ngoc Do  
Hien Dang Phuoc Nguyen pp. 793 - 803
- Digital Inclusion Through Innovative Library Management Systems in Digital Libraries: Literature Study*  
Dyana Maftuhatu Rosyidah  
Cepi S. Abdul Jabar  
Marvina Anan Dita  
Roudhotul Fitria  
Rio Sebastian  
Aryadi Manuel Gultom pp. 805 - 821
- Development of TPCK Creativity-Based Learning Model for Improving Grade 7 Students' Academic Achievement and Creative Thinking*  
Sawitree Inprom  
Khajornsak Buaraphan pp. 823 - 833
- Integration of STEAM With Local Context for Enhancing Early Childhood Students' Creativity*  
Sri Insura  
Jirutthitikan Pimvichai pp. 835 - 848
- Ustaz Hanafi: A Transformative Figure in Malay Silat Through the Education of the Persatuan Seni Silat Cekak Malaysia (PSSCM)*  
Mohd Azuwan Maoinsar. Universiti Teknologi PETRONAS  
Anis Suria Mohd Zainudin  
Abdul Hazim Abdullah pp. 849 - 857
- The Effect of e-Learning System on Academic Performance in Higher Learning Institutions in Tanzania: Moderating Effect of Behavioral Intention*  
Deus N. Shatta  
Bahati K. Mabina pp. 859 - 873

***Digital Inclusion Through Innovative Library Management Systems in Digital Libraries:  
Literature Study***

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**Abstract**

Library management systems in digital libraries can bring about innovation in digital inclusion. Digital library users will find it easier to access reading materials anywhere and anytime, so the purpose of this study is to identify the effect of using a library management system in digital libraries on digital inclusion innovation. This research is the result of a synthesis of the findings of previous research articles that are relevant in the 2018-2022 period. This study adapted the Systematic Literature Review method with Publish or Perish software, then filtered and extracted the data according to the criteria for the research objectives so as to produce 54 relevant articles and compiled using the Prisma Protocol. From the results of several research syntheses, it was found that the use of library management systems in digital libraries is able to provide digital inclusion innovations. The topics in the articles obtained mostly explain the development of inclusive digital library management systems. Most of the systems used are user interface applications. In addition, the use of the library management system has a positive impact in the form of increasing inclusive services for users. Future research is expected to be able to present in detail the influence of the library management system on digital libraries to develop digital inclusion that is more friendly for persons with disabilities.

Keywords: Digital Inclusion, Library Management System, Digital Library

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## Introduction

ICT's development impacts various aspects of life, but not all individuals and groups can fully utilize it due to the digital divide. (W. Wan Abdullah, F. Ahmad, 2018). The International Telecommunication Union reports that only around half the world's population has internet access (ITU, 2020). The digital divide affects access to libraries, essential institutions for community information, knowledge, and education (Edmund T Cabellon, 2016). Libraries and information are two things that are interconnected and cannot be separated (Hasugian, 2009). The library has a very important role and contribution to the experience of students because the library is something that continues to connect with students in terms of meeting student needs (Kezar A, 2006). Libraries have adapted to the digital age, expanding online services, resources, and operating hours to better connect with students and ensure accessibility. (Kezar A, 2006; Snaveley, 2012). Indonesia has a remarkably low interest in reading, as indicated by UNESCO's research, with only 0.001% engagement, but libraries can play a crucial role in improving this situation. (Perpusnas., 2021). Libraries, when utilized effectively, can serve as hubs for scientific development, discussions, and knowledge acquisition (Setiawan & Nuryana, 2020). Digital libraries aim to provide broader access to books and reading materials, but limited skills hinder some individuals, highlighting concerns about the digital divide and inequality. (F. Riggins, 2005; Parsons & Hick, 2008; Robinson et al., 2015). Digital inclusion is crucial for supporting individuals and communities in the digital age, addressing the pressing issue of the digital divide, and fostering societal development (Nguyen, 2020). Digital inclusion is also a determining factor for social inclusion (Alam & Imran, 2015; Helsper, 2012; Ragnedda, 2017; Warschauer, 2002). Digital inclusion refers to policies that address the digital divide, promote digital literacy, and reach out to underserved populations (Jaeger et al., 2012).

Library Management Systems (LMS) facilitate digital inclusion by transforming traditional libraries into digital ones through innovative management systems. (Shanmugam Ap Palanigounder, Ramalakshmi Arunachalam, 2020). Library management systems are vital for equitable access to libraries, supporting collection management, borrowing, inventory, and administrative tasks. Adopting these systems enhances operational efficiency, record accuracy, and overall patron service. Subramanian and Muthuraja (Subramanian, S., & Muthuraja, 2019) emphasized the importance of digital library management systems for organizing and accessing knowledge efficiently. Automated library management systems enhance service efficiency, underscoring their importance in library operations (El Naggari, H., & Elsayed, 2020; Rai, S., & Singh, 2020). Digital inclusion in library management involves leveraging technology to enhance accessibility, dissemination, and management of information resources. Innovative library management systems enable more efficient and effective services through software, mobile apps, online platforms, and other technologies for information access, digital borrowing, and various library activities (Das, A., Dey, S., & Maiti, 2018). Innovative library management systems promote digital inclusion and expand student and community engagement by providing easier access, benefiting previously excluded individuals, including those in remote areas, with disabilities, or facing physical accessibility limitations.

## Method

This research uses the Systematic Literature Review method to identify research topics related to digital inclusion through innovative library management systems and the impact of library management systems on digital inclusion. In Systematic Literature Review research, it

is necessary to identify as many previous studies that have been conducted in the field to be researched and which are most relevant to the research topic area, which is very important for its direction and methodology, so systematic screening is necessary.

### Search Strategy

The screening of journal articles in this SLR research uses the help of PoP (Publish or Perish) software with data sources on Google Scholar. The filtered articles have a range of 2018-2022 (the last five years) with the selection of keywords digital library, digital library management system, and digital inclusion.

### Publication Selection & Data Extraction

Based on the Prisma Protocol chart in Figure 1, the presentation of articles through the Publish or Perish search identified as many as 4920 articles. In the identification process, screening was carried out by eliminating articles that had never been cited so that 4797 articles were reduced. In the screening process, screening is carried out with criteria taken specifically for journal articles so as to exclude 4783 articles that are not included in the journal. Then, entering the eligibility assessment stage, there are two reasons; the first reason is to filter articles by determining the title of the library so that articles are filtered specifically for digital inclusion in articles with the word library only so that it is reduced to 125 articles. This was done because, in the database obtained by Publish or Perish, digital inclusion was found other than through the library. For the second reason, filtering was carried out with special criteria on journals that were cited more than ten times so as to better ensure the credibility of the article so that there were 54 articles that were reduced.

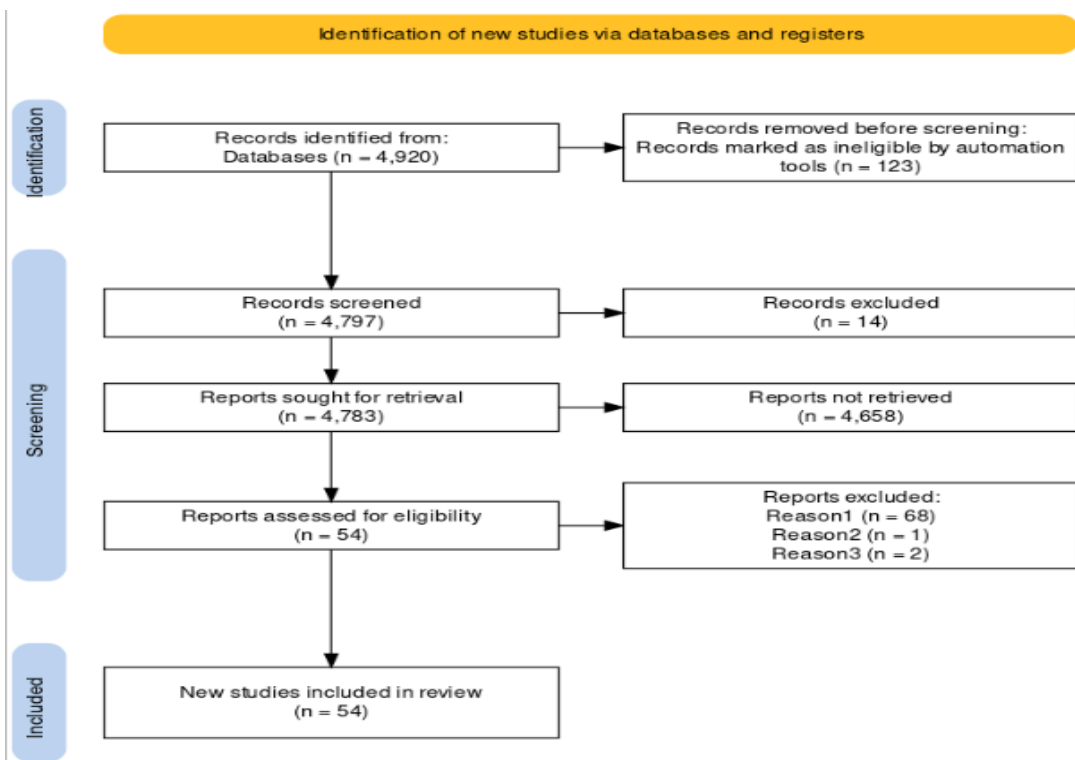


Figure: 1 PRISMA Diagram



Based on the entire screening series, as shown in the Prisma Protocol Chart, the final number of 54 articles related to the topic of digital inclusion through innovative library management systems was obtained. Thus, this research is directed to provide research results where the existing technology in the library management system can provide digital inclusion innovations to students in particular and the community in general in accessing the library and, in the future, can further develop technology in the library management system.

**Result**

**Article Characteristics**

In this SLR research, the final screening results were obtained from as many as 54 articles on the topic of digital inclusion through library management system innovation. The research articles were analyzed using VoSviewer software to find out the article keywords that often appear and other keyword associations. Analysis using VoSviewer can be seen through the keyword mapping shown in Figure 2.

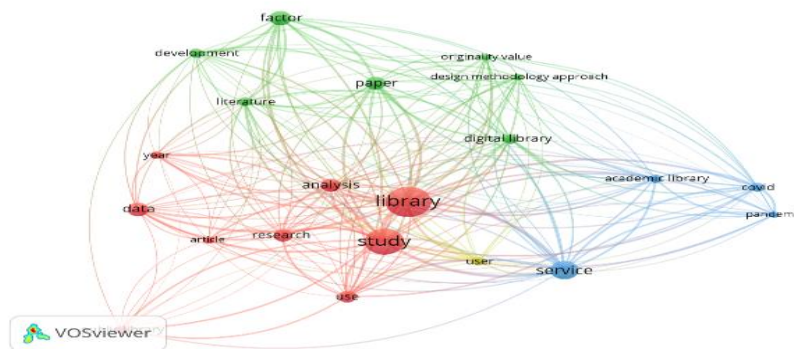


Figure 2: Obtained Article Keyword Mapping

Figure 2 it can be seen that the keyword about. In the research article, the distribution of each year can be shown through the graph in Figure 3.

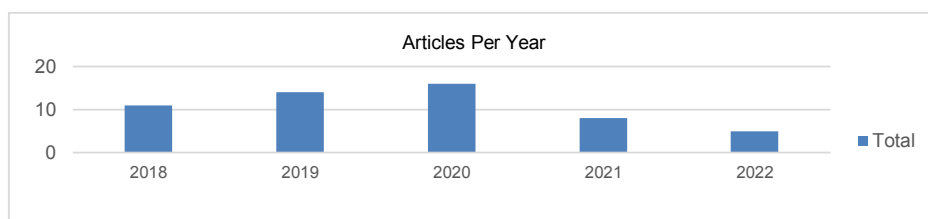


Figure 3: Distribution of Articles by Year

Based on Figure 3, it can be seen that most of the research articles obtained were published in 2020 and the least in 2022. The number of article citations obtained can be shown using the diagram in Figure 4.

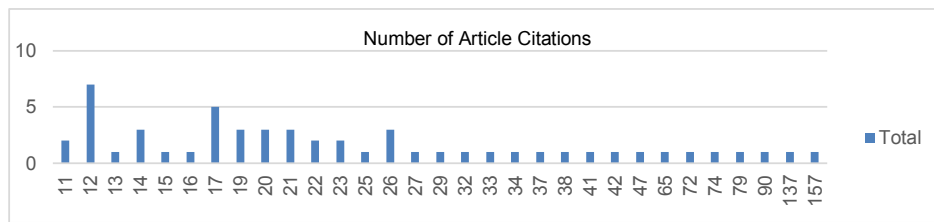


Figure 4: Number of citations of articles obtained

Based on Figure 4, it can be seen that the most cited article has 157 citations with a frequency of 1 article, while there are seven articles that have 12 citations. The distribution of journal publication sources and research articles obtained can be seen in the diagram below in Figure 5.

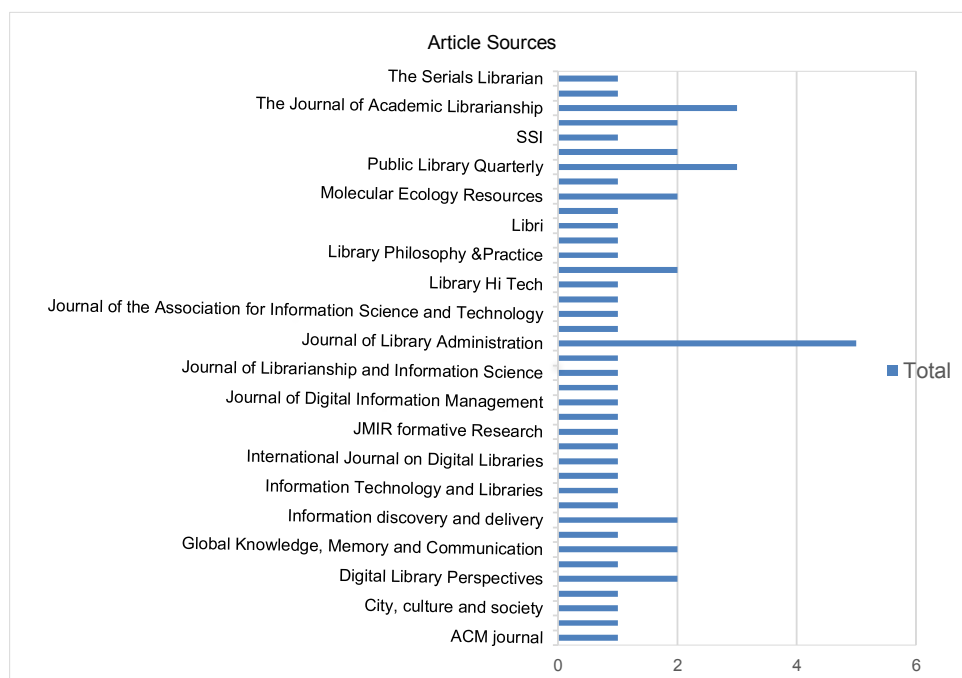


Figure 5: Distribution of Article Sources Obtained

Based on Figure 5, it can be seen that the distribution of the most sources of articles obtained from the Journal of Library Administration. Series as many as 4 articles. The distribution of article publications obtained can be illustrated with the diagram shown in Figure 6.

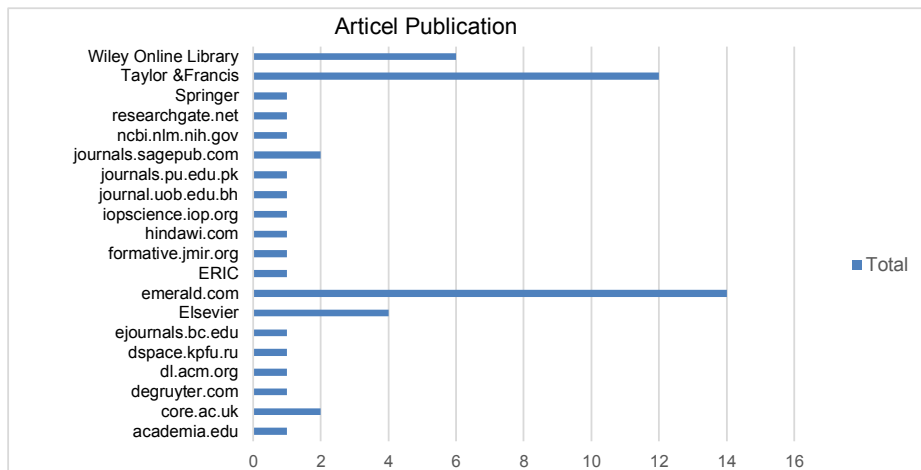


Figure 6: Distribution of Article Publications Obtained

Based on Figure 6, the distribution of the most article publications obtained is from Emerald.com, with as many as 14 articles.

Thus, it can be concluded that the characteristics of the articles obtained in the playback mostly carry the words Library, Service, and Digital Library most dominant in the articles obtained because they have a large circle, so it can be said that Library, Service, Digital Library, and Development with the most distribution of article years in 2020. The highest number of citations is 157 citations, and most articles have 12 article citations. From the acquisition of these articles, most journal sources come from the Journal of Library Administration with the most publications, namely Emerald.com.

**Use of Library Management System**

The use of library management systems in digital libraries is an innovation that can facilitate students and the community in accessing reading resources. With digitization, eating libraries today can also be accessed inclusively by anyone at any time. Based on the articles that have been obtained, the use of library management systems is often related to several topics shown in Figure 7.

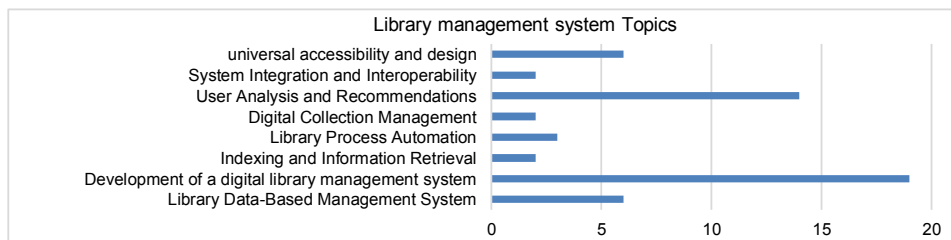


Figure 7: Library Management System Topics

Based on Figure 7, it can be seen that the most frequently implemented topics in library management systems are the topics of digital library management system development and user analysis and recommendations. The use of library management systems can support the needs of students and the community to access reading materials or books more easily and inclusively. Based on the articles that have been obtained, the form of presentation of the library management system can be shown through the diagram in Figure 8.

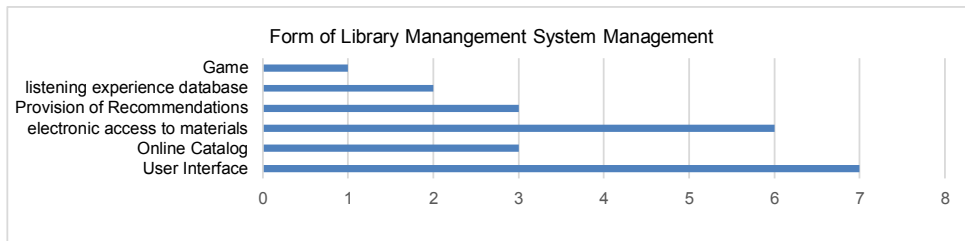


Figure 8: Form of Library Management System Presentation

Based on Figure 8, the presentation form of the library management system is often used in the form of a user interface and electronic access to materials.

The form of presentation of the library management system is adjusted to the needs and objectives of digital libraries to facilitate access to reading materials or books as a whole. The library management system in digital libraries is basically developed to further facilitate access to reading materials and books as a whole. The use of library management systems in digital libraries can provide an increase or impact on development and services to be more inclusive. Based on the articles that have been obtained, the library management system that can have a positive impact on digital inclusion can be shown through the diagram in Figure 9.

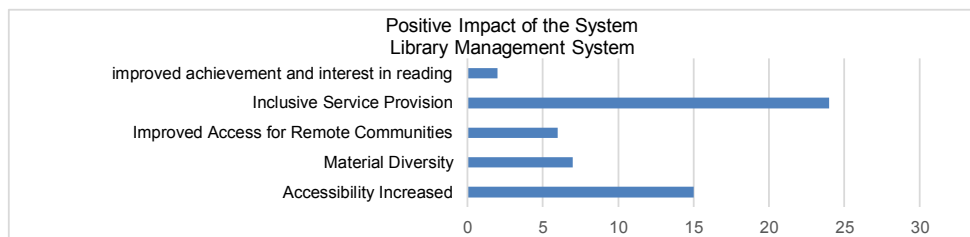


Figure 9: Positive Impact of Using the System Library Management System in the Library Digital

Figure 9 shows that the use of library management systems in frequent digital libraries provides a positive impact on the provision of inclusive services and increased accessibility.

Therefore, it can be concluded that the use of library management systems in the digital library shows the topics that are often implemented in the system library management system development digital as well as user analysis and recommendations, with most forms of presentation done in the form of a user interface and electronic access to materials. System usage library management at the library Digital has several positive impacts that can be felt by various parties. The most positive feeling is inclusive service provision, and accessibility increased (A., 2013; Adamou et al., 2019; AlAwadhi & Al-Daihani, 2019; Beyene, 2018).

**Discussion**

**Use of Management Systems Library in Digital Library**

Library Management Systems act as a tool for changing traditional libraries to digital libraries (SHANMUGAM AP PALANIGOUNDER, RAMALAKSHMI ARUNACHALAM, 2020).[18] A library management system is important to ensure that all members of society can feel the same benefits from the library. This system plays a crucial role in collection

management, lending, inventory, and administrative activities in the library. By adopting a Library Management System, Libraries can increase operational efficiency, improve the accuracy of recording, and provide services better to visitors.

Subramanian and Muthuraja (Subramanian, S., & Muthuraja, 2019) emphasize the importance of management systems digital library to organize and access knowledge efficiently. An automated library management system helps improve internal efficiency and provides library services; this shows that this system is so important in the context of service library (El Naggar, H., & Elsayed, 2020; Rai, S., & Singh, 2020). The inclusion of digital in library management includes the use of technology to improve accessibility, dissemination, and management of information resources in the library.

Based on that article obtained, the use of management systems library in digital library covers several topics, namely systems library data-based management (Ahlfeld, 2020; Ashiq et al., 2021; Deja et al., 2021; Gahagan & Calvert, 2020; Ma & Lund, 2021; Velasquez & Evans, 2018), Management system development digital library (A., 2013; Adamou et al., 2019; AlexanElizarovder & Novikov, 2019; Ångqvist et al., 2019; Beyene, 2018; Bohmann et al., 2022; Desmarais & Louderback, 2020; Do et al., 2019; Dresel et al., 2020; Elizarov & Lipachev, 2020; Harlow & Hill, 2020; Morinière et al., 2019; Murphy et al., 2022; Peacock et al., 2020; Rafi et al., 2019; Rosman et al., 2020; Singeh et al., 2020; Wang & An, 2019; Waterman et al., 2020; Zheng et al., 2022), Library Process Automation (Desmarais & Louderback, 2020; Leorke et al., 2018; Mbambo-Thata, 2021). Analysis Users and Recommendations (A., 2013; Afthanorhan et al., 2020; AlAwadhi & Al-Daihani, 2019; Ali et al., 2021; Cox et al., 2019; Do et al., 2019; Isibika & Kavishe, 2018; Lediga & Fombad, 2018; Marineo & Shi, 2019; Ocran et al., 2020; Pionke, 2020; Rahimi et al., 2019; Rutherford et al., 2018; Samsuddin et al., 2020), System Integration and Interoperability (Darch et al., 2020; Potnis et al., 2020), accessibility and design universal (Chisita & Chizoma, 2021; Cleave & Geijsman, 2020; Glusker et al., 2022; Rysavy & Michalak, 2020; Sanchez-Rodriguez & LoGiudice, 2018).

Based on the article that obtained, it can be seen that the topic is most often implemented in library management systems is topic Management system development digital library; this is because Libraries, especially in schools or universities, are obliged to develop information technology to achieve learning objectives with developing a digital library technology based. According to Deasy Lisa Damayant's study, Library management is very important. Digital library management begins with digital library planning, digital library budget funding, management of digital collections, management of human resources, monitoring and performance evaluation, analysis of obstacles, digital library management, and efforts to create a library management system that serves its aims to overcome them. Obstacle: Utilize digital libraries and build mutual relationships between librarians and students and teachers, with possible students and teachers accessing digital libraries more frequently (Damayanti et al., 2023).

### **The Form of Presentation of the Management System Digital Library**

The form of presentation of the management system library is tailored to your needs and digital library purposes for easy access to reading materials or books as a whole. System library management at the library digital is basically developed for easier access to reading and books overall.

Based on that article obtained, the existing form of presentation in the library management system in a digital library is the interface users (Elizarov & Lipachev, 2020; Leorke et al., 2018; Mbambo-Thata, 2021; Nneji, 2018; Singeh et al., 2020; Wan Zahari Wan Yusoff and Maziah Ismail, 2008; Zheng et al., 2022), electronic access to matter (Desmarais & Louderback, 2020; Dresel et al., 2020; Lediga & Fombad, 2018; Mbambo-Thata, 2021; Rahimi et al., 2019; Velasquez & Evans, 2018), database listening experience (Adamou et al., 2019; Waterman et al., 2020), online catalog (AlexanElizarovder & Novikov, 2019; Rafi et al., 2019; Velasquez & Evans, 2018), games (Cleave & Geijsman, 2020), providing recommendations (Beyene, 2018; Bohmann et al., 2022; Murphy et al., 2022).

Based on the articles obtained, it can be seen that the form of presentation of the library management system that is often used is in the form of a user interface. Many user interface applications have been created, according to research conducted by Maulana Y. & Dian P.S., which makes the user interface of the CIRLIB Application (Cirebon Library) in accordance with the fulfillment of user requirements. The application is designed in the form of use case diagrams, action diagrams, and user interfaces. User interface design services include essential library information, book lending services, on-site reading services, e-books, and education (Yusuf & Sari, 2023).

### **The Positive Impact of Using the System Library Management for Digital Inclusion**

Subramanian and Muthuraja (Subramanian, S., & Muthuraja, 2019) emphasize the importance of management systems digital library to organize and access knowledge efficiently. Automated library management system helps improve internal efficiency and provides library services; this shows that this system is so important in the context of service library (El Naggar, H., & Elsayed, 2020; Rai, S., & Singh, 2020). The inclusion of digital in library management includes the use of technology to improve accessibility, dissemination, and management of information resources in the library.

By implementing an innovative system of library management, libraries can provide more services efficiently and effectively to members of the public. Management system innovative library can involve the use of software, mobile applications, or online platforms for easy access and search information, borrowing and returning digital books, as well as usage of other technology to facilitate library activities (Das, A., Dey, S., & Maiti, 2018).

Based on that article obtained indicates that the use library management system on frequent digital library have a positive impact on inclusion digital is increasing accessibility (A., 2013; Ångqvist et al., 2019; Bohmann et al., 2022; Do et al., 2019; Kazuye Kimura, 2018; Leorke et al., 2018; Rutherford et al., 2018; Rysavy & Michalak, 2020; Singeh et al., 2020; Velasquez & Evans, 2018; Wan Zahari Wan Yusoff and Maziah Ismail, 2008; Wang & An, 2019), Material Diversity (Ahmad et al., 2018; Elizarov & Lipachev, 2020; Morinière et al., 2019; Nneji, 2018; Rafi et al., 2019; Wan Zahari Wan Yusoff and Maziah Ismail, 2008; Wittmann et al., 2019), inclusive service provision (A., 2013; Adamou et al., 2019; Afthanorhan et al., 2020; Ali et al., 2021; Anyim, 2019; Ashiq et al., 2021; Beyene, 2018; Chisita & Chizoma, 2021; Cox et al., 2019; Deja et al., 2021; Desmarais & Louderback, 2020; Glusker et al., 2022; Isibika & Kavishe, 2018; Ma & Lund, 2021; Mbambo-Thata, 2021; Peacock et al., 2020; Potnis et al., 2020; Rahimi et al., 2019; Rahmat & Saqlain Raza, Hasan Zahid, Jaffar Abbas, Fatimah Azzahraa Mohd Sobri, 2022; Rosman et al., 2020; Sanchez-Rodriguez & LoGiudice, 2018; Zheng et al., 2022), achievement and interest read increases (Cleave & Geijsman, 2020; Marineo & Shi, 2019).

Based on the article obtained, it can be seen that the management system used library in digital libraries often has a positive effect on the provision of inclusive services. Basic library services must continue to grow in inclusion to form a society that has access to complete reading materials easily, anywhere and anytime.

This is what Sudarmin et al (Damayanti et al., 2023) said. According to research, change-based library social inclusion is an effort to create an educated society in library and archival services. Enrekang Regency, through various strategies, involves librarians in active roles, politics publishing one. Order and the formation of synergistic teams, meeting stakeholders, launching Enrekang library, and organizing co-learning meetings. However, the Library and Archives Service Enrekang Regency also met some problems in developing a library based on social inclusion. Source limited budget resources and network Internet. The goal is to overcome obstacles by collaborating with various actors (Cleave & Geijsman, 2020; Marineo & Shi, 2019) at the state level, district, and private and to optimize the existing budget as well as possible.

### **Conclusion**

From the presented information, it can be concluded that digital library management systems play a crucial role in transforming traditional libraries into digital entities, advancing service delivery, and resource management. The primary focus of this research is the development of digital library management systems, particularly in educational settings, utilizing information technology to achieve learning objectives and foster digital libraries. These systems come in various presentation forms, with user interfaces being the most commonly used. The implementation of these systems has a positive impact on digital inclusion by enhancing accessibility, diversifying materials, and providing inclusive services. Despite challenges such as resource limitations and internet connectivity issues, collaborative efforts with stakeholders can offer solutions. This research provides an in-depth understanding of how innovation in digital library management systems can enhance digital inclusion, broaden access, and advance learning and reading interests.

### **Acknowledgements**

The researcher would like to acknowledge the support from the Ministry of Finance, Indonesia, through the Endowment Fund for Education (LPDP).

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