International Journal Software Engineering and Computer Science (IJSECS) 3 (3), **2023, 213-218**
Published Online December 2023 in IJSECS (http://www.journal.lembagakita.org/index.php/ijsecs)
P-ISSN : 2776-4869, E-ISSN : 2776-3242. DOI: https://doi.org/10.35870/ijsecs.v3i3.1755.

Digital Library Development Strategy at Universitas Muhammadiyah Tapanuli Selatan

Efi Amrina Lubis *
Postgraduate Library Science, Universitas Islam Negeri Sunan Kalijaga, Yogyakarta Special Region, Indonesia.
Email: efiamrinalubis14@gmail.com

Dwi Sundariyati
Postgraduate Library Science, Universitas Islam Negeri Sunan Kalijaga, Yogyakarta Special Region, Indonesia.

Anis Masruri
Postgraduate Library Science, Universitas Islam Negeri Sunan Kalijaga, Yogyakarta Special Region, Indonesia.

Received: 24 October 2023; Accepted: 17 November 2023; Published: 1 December 2023.

Abstract: The advent of Information and Communication Technology (ICT) has significantly transformed library paradigms, shifting from traditional manual systems to digital platforms, a change particularly evident in academic libraries. This study focuses on the University of Muhammadiyah Tapanuli Selatan, aiming to develop a strategic framework for its digital library to enhance services in alignment with the tridharma of higher education. Employing a qualitative, descriptive methodology, the research incorporates both primary and secondary data sources. The analysis involves data reduction, presentation, and conclusion drawing. Results show that the University's library, accessible through Windows and Android applications, has experienced a marked increase in user engagement from 2020 to 2023. However, despite this growth, the development of the digital library requires further enhancement to fully realize its potential and meet user expectations. This study underlines the need for ongoing development strategies in digital libraries to keep pace with technological advancements and evolving user needs.

Keywords: Development; Digital Library.

1. Introduction

The emergence of the Internet and rapid advancements in Information and Communication Technology (ICT) have heralded significant transformations across various sectors, notably in the realm of libraries. This digital revolution has not only modified library systems but has also introduced new paradigms and terminologies, such as 'digital libraries', into the lexicon of library science. Digital Libraries, as defined by Kucirkova (2018), serve as repositories for journals, books, and documents in digital formats [1]. They function not merely as storage facilities for collections but also as centers for data management. The evolution of libraries can be segmented into three distinct periods: the era of traditional libraries, characterized by paper-based collections and card catalog systems; the automation period, where collections remained paper-based but were supplemented by computerized Online Public Access Catalogs (OPAC); and the current era of digital libraries, distinguished by digital files accessible via the Internet and stored in library databases. From a service perspective, traditional libraries offered manual user services, a practice that continued into the automation era, although cataloging processes were shifted online. In contrast, digital libraries enable a range of services to be performed with computer assistance, including self-service options for borrowing and returning materials [2]. Digital library services differ markedly from those of traditional and automated libraries, necessitating continuous development strategies in response to rapidly evolving technology. These strategies consider several factors, including resource availability, technological progress, and user needs.

At the University of Muhammadiyah Tapanuli Selatan (UMTS), a higher education institution committed to fulfilling the tridharma (three principles) of education, research, and community service, the library plays a pivotal role. As outlined in Government Regulation No. 30 of 1990 regarding Higher Education, the library is a crucial support element for these institutional missions, underscoring the importance of providing top-quality services. The UMTS library established its digital library in 2020 in collaboration with PT. Enam Kubuku Indonesia. However, its development has been stagnant since its inception. The digital library's collections are accessible through Windows and Android platforms at https://kubuku.id/download/e-library-umts, under the name e-library UMTS. To access this digital library, users must

register as library members and obtain a verified personal account. Given the limited development of the UMTS digital library and the growing demands for technological adaptation and information accessibility, there is a pressing need for a comprehensive development strategy.

In the realm of digital library development, a notable study by Wang & Ding (2022) Development Strategy of Intelligent Digital Library Without Human Service In The Era Of Internet offers insights into the evolution of libraries without direct human intervention. This research highlights strategies for enhancing the accuracy of book sample location perceptions and the efficacy of data mining, ultimately advocating for the reinforcement of top-level design and system improvements in digital libraries [3]. Although this study shares similarities with ours in terms of digital library development strategies, the focus of our research is specifically on the digital library at the University of Muhammadiyah Tapanuli Selatan. Another significant work by Ayu Puspa Arum and Yoana Marfianti in 2021, Digital Library Development for Easier Access to Information, outlines five key strategies to facilitate information access through digital libraries, encompassing information technology implementation, digital library management, human resources, joint policy access, and cultural diversity methods [4]. While there is a commonality in the digital library context, our study is distinct in its concentration on the digital library at the University of Muhammadiyah Tapanuli Selatan, as opposed to a broader focus on information access. Lastly, the research by Mugi Praseptiawan, Puji Siswanto, and Tjut Afrida in 2019, Digital Library Development and Evaluation to Improve Students' Digital Literacy, utilized a Research and Development (R&D) methodology. Their findings revealed enhanced information technology literacy in students using digital libraries and highlighted the suitability of M-library for learning processes, as evidenced by positive feedback from 80.9% of participants [5]. This study parallels ours in developing digital libraries but differs in its object of study, focusing on STKIP Setiabudhi Rangkasbitung's library, while our research centers on the digital library at the University of Muhammadiyah Tapanuli Selatan.

The current research on the development of the digital library at the University of Muhammadiyah Tapanuli Selatan is intricately linked to prior studies in the field. Wang & Ding (2022) study provides a foundational understanding of autonomous digital libraries, emphasizing the importance of technology integration and high-level system design [3]. This insight is crucial for the current study's objective to enhance technological aspects and user experience in the university's digital library. Arum and Marfianti (2021) research, focusing on methods for easier access to information in digital libraries, aligns with the aim of improving digital interface and accessibility at the university's library, highlighting the significance of information technology application and effective management practices [4]. Additionally, Praseptiawan, Siswanto, and Afrida (2019) study on digital literacy underscores the importance of digital libraries in enhancing educational outcomes [5]. By adopting strategies from these studies, the current research seeks to develop a digital library that not only integrates advanced technologies but also enhances user accessibility and educational impact, thus contributing to the overall academic and research environment of the University of Muhammadiyah Tapanuli Selatan.

2. Research Method

The research employs a qualitative descriptive methodology, incorporating observational, interview, and documentary methods. This study is categorized into two types: descriptive and literature review. The descriptive aspect, as defined by Imam Gunawan (2013), focuses on portraying information based on factual data gathered from the field, while the literature review component involves analyzing previous studies and literature [6]. Data sources are bifurcated into primary and secondary categories. Primary data sources directly provide information to the researcher, whereas secondary data sources offer indirect information, such as through other individuals or documents, as explained by Sugiyono (2014) [7]. Primary sources in this study include observations and interviews, while secondary sources encompass journal articles, books, and websites. Data analysis in this research follows a descriptive analytical approach, aimed at presenting a factual, accurate, and systematic depiction of the facts and relationships among the phenomena under study. The process involves three key steps: data reduction, data display, and drawing conclusions [8]. The analysis is conducted upon the collection of necessary data, focusing on the stages of digital library development at the University of Muhammadiyah Tapanuli Selatan. This approach allows for a comprehensive understanding of the digital library's evolution, reflecting both the current status and potential future developments.

3. Result and Discussion

3.1 Results

The term digital word first appeared in 1988 by the Corporation for National Research Initiatives. After the existence of digital, it accompanied libraries and developed into the Digital Libraries Initiative, popularized by the National Aeronautics and Space Administration (NASA), the National Science Foundation (NSF), and the Defense Advanced Research Projects Agency (DARPA) in 1994. According to Singh, who is in the book (Tella, 2016) digital library is a digital library is a library where collections are processed and stored in a digital format that facilitates electronic searching

and retrieval [9]. via digital devices such as computers, cell phones and other handheld devices. The digital library information system consists of software, hardware and brainware that manage and operate digital libraries.

According to Pendit in the journal (Khariroh, 2020), it is necessary to pay attention to the three most important aspects in creating a digital library, namely organization, mechanization, and legality [10]. The first organizational indicator is the arrangement of information resources for library services, and human resources in terms of managing libraries in general. This also relates to the connectivity and changes needed for libraries to utilize digital technology. The organization of information has changed since the use of computers as a means for storing and searching for information. The second indicator of mechanization is operating libraries where librarians are asked to know the basic characteristics of technology and how to use these characteristics to manage conventional libraries into digital ones. Librarians must have the idea that mechanization and automation for operating libraries is a new phenomenon in the digital era. Thirdly, legality in libraries needs to regulate their rights and obligations regarding the presentation, storage, distribution, and use of information in digital libraries. The library has ethical and legal principles based on statutes in print and digital form. The world of library science has changed due to digital technology so that librarians must understand the new laws that are needed to carry out library functions in the legal environment of society.

According to Saleh in the book (Hartono, 2019) there are five reasons why digital libraries must be developed [11], namely:

1) Conventional libraries have a weakness in providing services, namely having single access. Solving this problem of limited access, digital libraries are expected to be able to provide multiple access to documents more quickly.
2) Conventional libraries have very limited access points. Search points in conventional libraries can only be seen through the card catalog or Online Public Access Catalog (OPAC), whereas in digital libraries users can search for words using boolean operators.
3) Conventional libraries require complex authority in their use, for example the lending system requires several steps such as recording returns, recording loans, recording fines, recording borrowing statistics, collecting late loans and so on. In digital libraries this process is simplified. Once the metadata is created and the digital document is stored on the server, the subsequent recording process can be carried out automatically by the computer software system.
4) Conventional libraries require a lot of librarians because a lot of work is physical and, for example, librarians have to return books to the shelves (shelving). Meanwhile, digital libraries do not require shelving because they are automated.
5) Conventional libraries require large building space, while digital libraries do not require large space because they are in the form of files.

The explanation above makes it clear that the importance of digital libraries being developed means that digital library development strategies need to be carried out in terms of software, hardware, and users (brainware). The development strategy for digital libraries in most Islamic University libraries in Indonesia can be implemented in 5 ways, namely the digital library organization and management approach, the digital library implementation approach, the information access and legality policy approach, the transformation of cultural diversity values approach, the cooperation and resource sharing approach, information access and legality policy approaches [4]. The South Tapanuli Muhammadiyah University (UMTS) library is a digital library type in the form of an application via Windows and Android. The library has collaborated with PT Kubuku Indonesia since 2020. The Muhammadiyah University of South Tapanuli (UMTS) library is a type of digital library in the form of an application via Windows and Android which is available at the link https://kubuku.id/download/e-library-umts which can be seen in picture 1 initial display.

Figure 1. Basic appearance of the Digital Library of South Tapanuli Muhammadiyah University

Based on the statistical data in Figure 2, the number of visitors from 2020-2023 has increased very significantly, so it can be said that library development in digital libraries has started to operate in previous years. The total book collection currently is 701 book titles with the subjects found in the digital books of the Muhammadiyah University of South

Tapanuli library, namely general subjects ranging from class 000 to 900. On average, visitors to the digital library only read, only a few borrow books. The following are visitor statistics from 2020-2021.

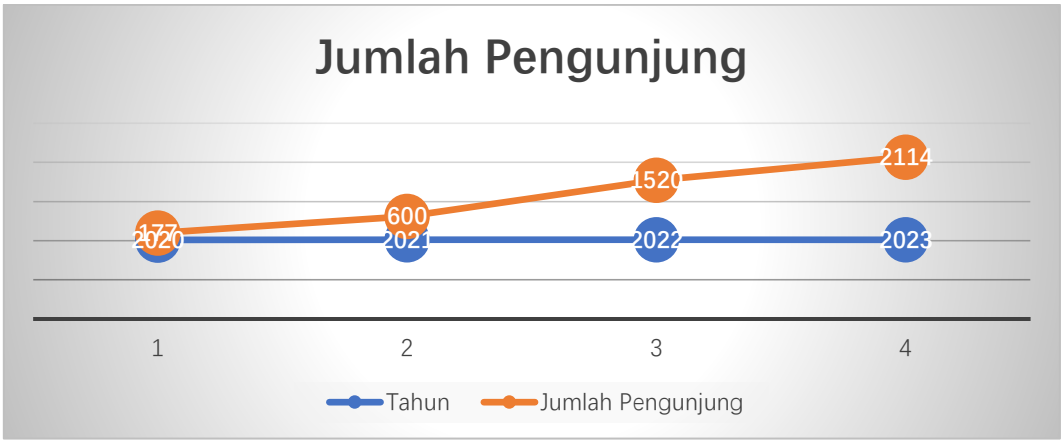

Figure 2. Visitor Statistics from 2020-2021
Source: https://kubuku.id/perpus/index.php.

The development of digital libraries which is in line with the development of digital collections at the Muhammadiyah University of South Tapanuli has progress that can be categorized as inadequate even though the number of visitors has increased from the previous year. This can be seen from the collection side, the number of users and visits by digital library users is still small compared to the number of students. Data from the Ministry of Education and Culture in 2023, the number of students at Muhammadiyah University of South Tapanuli is 2,363 students (https://pddikti.kemdikbud.go.id/data_pt). Regarding this data, the number of library visitors is not proportional to the number of students there. Therefore, better development is needed in the digital library of the Muhammadiyah University of South Tapanuli.

The important thing that needs to be considered in the development of digital libraries is that they must be supported by hardware, software and brainware (users). These three aspects are interrelated tools involved in the development of digital libraries. At the Muhammadiyah University of South Tapanuli library, in terms of hardware and software that is already available, development needs to be considered so that the available digital library can be utilized optimally. Since the existence of digital libraries in 2020 until now there has been no development in the field of hardware and software, for example updating the digital library management system. Development only increases the collection of books in the digital library. If the hardware and software are adequate, it is the librarian's job to introduce readers to the digital library. So, librarians and users must continue to improve to catch up with technological advances and advances so that problems related to the development of digital libraries can be overcome.

3.2 Discussion

The discussion of the results highlights the critical evolution and development of digital libraries, with a particular focus on the University of Muhammadiyah Tapanuli Selatan (UMTS). The term 'digital' first emerged in 1988, leading to the establishment of Digital Libraries Initiatives by organizations like NASA, NSF, and DARPA in 1994. Digital libraries, as defined by Singh in Tella (2016) book, are digital repositories facilitating electronic searches and retrievals across various devices [9]. According to Pendit, as mentioned in Khariroh (2020) journal, three pivotal aspects in creating digital libraries are organizational structure, mechanization, and legality [10]. These involve managing information resources, transitioning to digital technology, understanding the basic characteristics of technology for library management, and addressing the legal aspects of digital information storage and distribution. Saleh, in Hartono (2019) book, emphasizes five reasons for developing digital libraries over conventional ones, including overcoming single access limitations, limited access points, complicated authority in usage, physical labor requirements, and space constraints [11]. This discussion underscores the necessity of a comprehensive development strategy encompassing software, hardware, and user engagement. At UMTS, the digital library, operational since 2020, is accessible via Windows and Android platforms, in collaboration with PT Kubuku Indonesia. Despite a significant increase in visitor numbers from 2020 to 2023, the library's development, especially in terms of collection size and user engagement, has been less than adequate compared to the total student population. This disparity calls for a more robust development strategy that extends beyond mere collection expansion to include improvements in hardware and software, as well as user education and engagement. The need for continual updates and enhancements in digital library infrastructure, including both hardware and software, is critical. Furthermore, librarians play a vital role in familiarizing users with digital library resources, ensuring they keep pace with technological advancements. This holistic approach to development is essential for the digital library at UMTS to fully realize its potential as a modern educational resource.

4. Related Work

The field of digital library development has witnessed significant evolution in response to the transformative impact of the Internet and Information and Communication Technology (ICT). The emergence of digital libraries, as defined by Kucirkova (2018), has fundamentally altered the landscape of library science, shifting from paper-based collections to digital repositories that facilitate electronic access and retrieval [1]. This transition can be contextualized within the broader history of library development, encompassing three distinct periods: traditional libraries relying on paper-based collections and card catalogs, the automation era marked by computerized Online Public Access Catalogs (OPAC), and the current era of digital libraries characterized by digital files accessible via the Internet. One key aspect highlighted in the development of digital libraries is the need for comprehensive strategies that consider organizational structure, mechanization, and legality, as identified by Pendit [10]. Organizational considerations encompass the management of information resources and the transition to digital technology, while mechanization involves the adoption of technology to operate libraries efficiently. Legality considerations address the ethical and legal principles governing the presentation, storage, distribution, and use of digital information within libraries. Saleh research (Hartono, 2019) emphasizes five compelling reasons for the development of digital libraries [11]. These include overcoming limitations related to single access, providing multiple access points, simplifying complex authority systems, reducing the need for physical labor, and minimizing space requirements. These advantages highlight the efficiency and accessibility advantages offered by digital libraries over traditional counterparts. The case study of the University of Muhammadiyah Tapanuli Selatan (UMTS) digital library underscores the importance of developing digital libraries in higher education institutions. Despite a significant increase in visitor numbers from 2020 to 2023, the library's development, especially in terms of collection size and user engagement, has been less than adequate compared to the total student population. This case highlights the pressing need for a comprehensive development strategy encompassing software, hardware, and user engagement to fully leverage the potential of digital libraries in educational settings. In the realm of digital library development, Wang & Ding (2022) study offers insights into the development of intelligent digital libraries without direct human service, focusing on enhancing book sample location perceptions and data mining [3]. While sharing similarities with the current research, Wang & Ding provides a broader perspective on autonomous digital libraries. Another significant work by Arum and Marfianti (2021) outlines key strategies for easier access to information in digital libraries, emphasizing information technology implementation and effective library management [4]. While their research shares common themes with the current study, our research specifically focuses on the digital library at the University of Muhammadiyah Tapanuli Selatan. Lastly, Praseptiawan, Siswanto, and Afrida study (2019) on digital library development and its impact on students' digital literacy highlights the importance of digital libraries in enhancing educational outcomes [5]. While their study focuses on a different institution, it aligns with our goal of developing a digital library that enhances technological aspects, user accessibility, and educational impact. In summary, the related work provides a comprehensive view of the evolution of digital libraries and the challenges they face. It emphasizes the need for strategic development strategies that encompass software, hardware, and user engagement to fully realize the potential of digital libraries in modern educational settings.

5. Conclusion

Based on the discussions and research findings, it can be concluded that the development of the digital library at the University of Muhammadiyah Tapanuli Selatan has not reached an optimal level. Therefore, a more comprehensive development effort is needed to ensure that the digital library can be utilized to its full potential. The digital library has significant potential to support user needs in line with the ongoing technological advancements. The transformation from a conventional library to a digital library requires support from various aspects, including hardware, software, and user (brainware). These three elements must be adequate and continuously improved to ensure that the digital library operates optimally and sustainably. Thus, the development of the digital library at the University of Muhammadiyah Tapanuli Selatan is a pressing necessity to ensure effective utilization in accordance with technological advancements and user requirements.

References

[1] Kucirkova, N., 2018. *How and why to read and create children's digital books: A guide for primary practitioners* (p. 200). UCL Press.

[2] Sungadi, S., 2017. Perubahan Paradigma Perpustakaan. *Buletin Perpustakaan Universitas Islam Indonesia*, pp.11-26.

[3] Wang, H. and Ding, J., 2022. Development Strategy of Intelligent Digital Library without Human Service in the Era of "Internet+". *Computational Intelligence and Neuroscience*, *2022*. DOI: https://doi.org/10.1155/2022/7892738.

[4] Arum, A.P. and Marfianti, Y., 2021. Pengembangan perpustakaan digital untuk mempermudah akses informasi. *Information Science and Library*, *2*(2), pp.92-100. DOI: http://dx.doi.org/10.26623/jisl.v2i2.3290.

[5] Praseptiawan, M., Siswanto, P. and Afrida, T., 2019, July. Digital Library Development and Evaluation to Improve Students' Digital Literacy. In *Journal of Physics: Conference Series* (Vol. 1179, No. 1, p. 012042). IOP Publishing. DOI: 10.1088/1742-6596/1179/1/012042.

[6] Gunawan, I., 2022. *Metode Penelitian Kualitatif: teori dan praktik*. Bumi Aksara.

[7] Sugiyono. 2014. *Memahami Penelitian Kualitatif*. Yogyakarta: Alfabeta.

[8] Sugiyono. 2013. *Metode Penelitian*. Yogyakarta: Alfabeta.

[9] Tella, A. ed., 2016. *Information seeking behavior and challenges in digital libraries*. IGI global.

[10] Khariroh, Umi. 2020. Perkembangan Perpustakaan Digital Dalam Pemikiran Putu Laxman Pendit Dan Abdul Rahman Saleh.

[11] Hartono. 2019. *Manajemen Perpustakaan Elektronik Konsep Dasar Dinamika Dan Sustainable Di Era Digital*. Gava Media.