# Implementation of Library Digitalization System as an Effort Improving Educational Literacy in South Sulawesi

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*Abstract*

*Library digitization is key to enhancing accessibility and the utilization of information in order to improve educational literacy in the digital era. South Sulawesi, as part of Indonesia's rapidly developing region, needs to strengthen its information infrastructure, such as digital libraries, to address users' behavior towards technological advancements. The objective of this research is to analyze the implementation of the library digitization system in South Sulawesi by evaluating implementation strategies, identifying success factors and challenges, and understanding its impact on library services and public access to information. This research employs a mixed methods approach, combining quantitative and qualitative data analysis in parallel. Quantitatively, surveys (both offline and online) were conducted to collect data on implementation strategies, success factors, and barriers to library digitization. Qualitatively, in-depth interviews and document analysis were used to explore the impact of library digitization on services and public access to information. The results show that the level of library digitization implementation in South Sulawesi remains low. Existing digitization strategies vary but are generally hindered by limited infrastructure and human resources. Success factors include government support and collaboration with other institutions, while the main challenges involve insufficient funding, resistance to change, and low digital literacy among the population. The positive impacts of digitization include improved access to information and better quality library services, although there are still challenges in maintaining the systems. Key recommendations include improving infrastructure, staff training, and increasing public digital literacy.*

*Keywords: digitization; library; educational literacy; information technology*

**Abstrak**

Digitalisasi perpustakaan menjadi kunci dalam meningkatkan aksesibilitas dan pemanfaatan informasi guna peningkatan literasi pendidikan di era digital. Sulawesi Selatan, sebagai bagian dari wilayah Indonesia yang berkembang pesat, perlu memperkuat infrastruktur informasi seperti perpustakaan digital untuk menghadapi perilaku pemustaka terhadap perkembangan teknologi. Tujuan dari penelitian ini untuk menganalisis implementasi sistem digitalisasi perpustakaan di Sulawesi Selatan dengan mengevaluasi strategi implementasi, mengidentifikasi faktor keberhasilan dan hambatan, serta memahami dampaknya terhadap pelayanan perpustakaan dan akses informasi masyarakat. Penelitian ini menggunakan metode *mixed methods research*, yaitu dengan menggabungkan analisis data kuantitatif dan kualitatif secara paralel. Secara kuantitatif, dilakukan metode survei (*offline* dan *online*) untuk mengumpulkan data tentang strategi implementasi, faktor keberhasilan serta faktor yang menjadi hambatan dalam implementasi digitalisasi perpustakaan. Sedangkan secara kualitatif, dilakukan wawancara mendalam dan analisis dokumen untuk mengeksplorasi dampak implementasi digitalisasi perpustakaan terhadap pelayanan perpustakaan dan akses informasi masyarakat. Hasil penelitian menunjukkan bahwa tingkat implementasi digitalisasi perpustakaan di Sulawesi Selatan masih rendah. Strategi implementasi digitalisasi yang ada bervariasi, namun umumnya terhambat oleh keterbatasan infrastruktur dan sumber daya manusia. Faktor keberhasilan mencakup dukungan pemerintah dan kerjasama dengan lembaga lain, sementara hambatan utama meliputi kurangnya pendanaan, resistensi terhadap perubahan, dan rendahnya literasi digital masyarakat. Dampak positif dari digitalisasi meliputi peningkatan akses informasi dan kualitas pelayanan perpustakaan, meskipun masih terdapat tantangan dalam pemeliharaan sistem. Rekomendasi utama mencakup peningkatan infrastruktur, pelatihan staf, dan peningkatan literasi digital Masyarakat.

**Kata Kunci**: digitalisasi; perpustakaan; literasi pendidikan; teknologi informasi

## Introduction

Libraries have become the core of academic and research activities, facilitating access to a wide range of knowledge and information (Andayani U., 2000). However, with rapid changes in information and communication technology, the library paradigm has shifted towards widespread digitalization (Rangkuti LA., 2012). In the digital era, libraries are required to adapt their services to remain relevant and beneficial to the wider community (Hermadilla EJ., 2022). Library digitization promises increased accessibility, flexibility, and efficiency in the wide dissemination of information (Raj SK., 2019). Library digitization is a library that uses information technology and its collections in digital form, can be accessed anytime and anywhere, and the dissemination of information is very fast, precise and accurate (Khovrichev MY., 2020). This is of course in accordance with the behavior of the millennial generation where getting the need for information does not need to take a long time (Rosa I., 2019). However, the implementation of digitalization also involves challenges such as lack of infrastructure, limited technical expertise, and wide availability of funds (Prasetyo A., 2019).

South Sulawesi is one of the provinces in Indonesia, not spared from the impact of significant changes in the context of information and communication technology, one of which is on libraries. However, several libraries in South Sulawesi still face challenges in implementing digitalization. As technology continues to evolve, access to digital information sources is becoming increasingly important for the wider community (Wang C., 2021). Therefore, evaluating the level of implementation of library digitization in South Sulawesi is important to be able to ensure that the people of South Sulawesi can access information more easily and efficiently (Aminullah AM., 2021), Improving broad information literacy (O'Hara G., 2020), and support the sustainable development of the region through better access to broad knowledge and information (Yusniah Y., 2023).

Based on existing phenomena, this study was conducted with the aim of analyzing the implementation of the library digitization system in South Sulawesi by evaluating implementation strategies, identifying success factors and obstacle factors, and understanding their impact on library services and public access to information. With a better understanding of the challenges and opportunities of library digitalization, more effective strategies and policies can be designed to increase the role of libraries in supporting education, research, creating a literate society and supporting development in South Sulawesi.

The formulation of the problem that will be answered in this study is how the level of implementation of the library digitization system in South Sulawesi is reviewed from the implementation strategy, success factors, obstacle factors, and its impact on library services and public access to information. The urgency to conduct this research is to evaluate the level of implementation of the library digitization system, and further ensure that the people of South Sulawesi can access information more easily and efficiently, increase information literacy, and support sustainable regional development through better access to knowledge and information.

## Methods

This research uses an approach method *mixed methods research*, namely by combining quantitative and qualitative data analysis in parallel. This approach was chosen on the grounds that it allows researchers to gain a comprehensive understanding of the implementation of the library digitization system in South Sulawesi. Quantitatively, a wide survey method was carried out (Sugiyono., 2023) which is divided into two (2) types, namely online surveys through *google form* which was sent to library managers, and offline surveys, namely by visiting/surveying several libraries in Regencies/Cities in South Sulawesi to collect data on implementation strategies, success factors and factors that are obstacles in the implementation of library digitization. Meanwhile, qualitatively, in-depth interviews were conducted with librarians who handle the digitization section of the library and also interviews with users who use digital library services, as well as document analysis to explore the impact of library digitization implementation on library services and public access to information. The following library data is a sample in this study:

Table 1. Research Samples

| LIBRARY TYPES | SUM |
|---|---|
| School Library | 25 |
| College Library | 11 |
| Regency/City Library | 8 |
| Special Library | 9 |
| SUM | 53 |

## Results and Discussion
## Implementation of Library Digitalization System in South Sulawesi

### 1. Library digitization implementation strategy

The implementation of the library digitization system in South Sulawesi takes a comprehensive and structured approach, covering various aspects such as technological infrastructure development, human resource capacity building, collaboration and policy support, data management and system integration, and community involvement.

a. Technology infrastructure

The first strategy that needs to be implemented is the development of technological infrastructure. One of the steps taken in this case is to increase the internet connection in the library. Currently, many libraries in South Sulawesi still experience limitations in terms of speed and stability of internet connections, which greatly affects their ability to provide digital services. Cooperation with internet service providers (ISPs) is very important, with the aim of ensuring libraries have access to fast and stable internet connections. In addition, libraries must develop additional infrastructure, such as a robust *wi-fi* network throughout the library area, to support user access to digital resources.

In addition to internet connections, the procurement of adequate hardware is also a top priority in the digitalization strategy. Many libraries in South Sulawesi use computers, but with low specifications and servers that are not able to support the operation of digital library management software efficiently. Therefore, libraries must allocate a budget for the procurement of computers and servers with appropriate specifications. *Servers* that have large storage capacity and high performance are indispensable to manage and store digital data securely. In addition to procurement, libraries also need to plan regular maintenance and hardware updates to ensure that all devices function optimally and are able to keep up with technological developments.

Libraries in South Sulawesi have also used software, but it is necessary to conduct a thorough evaluation to choose a digital library management software that suits their needs. The use of software capable of managing online catalogs, digital lending, and access to *e-books* and electronic journals will greatly help in improving the efficiency and quality of library services. In choosing software, libraries can consider between open source and commercial software. Open source software is often more flexible and can be tailored to the specific needs of the library, while commercial software may offer better technical support. Additionally, it is important to ensure that the digital library management system integrates well with other existing systems, such as physical lending and catalog systems.

b. Human Resource Development

Increasing the capacity of human resources is also a key element in the library digitization strategy. Library staff need to be continuously trained to master the use of library management software, hardware maintenance, and other digitization techniques. These ongoing training programs should be designed to ensure that library staff are always prepared to face the challenges of ever-evolving technology. Certification for staff who have completed training can also be an incentive, which not only improves their competence, but also provides recognition for the expertise they have achieved. In addition to technical training, libraries also need to increase digital awareness among staff by organizing workshops and seminars that introduce new technologies and best practices in digital library management.

The development of digital-based user services is also a key focus in this strategy. Libraries should develop user-friendly digital library portals, which allow users to easily access online catalogs, borrow e-books, and use other library services. Given the large number of users who rely on *mobile* devices, libraries should also consider developing *mobile* applications that can be easily accessed from their devices. These apps can include features such as catalog search, book ordering, and access to digital resources, all of which aim to improve

convenience and efficiency for users. In addition, libraries need to run information literacy campaigns to help people understand and utilize available digital resources. The program can include workshops, online tutorials, as well as the provision of educational materials published on the *library'*s website.

c. Collaboration and policy support

Collaboration with various institutions has also been carried out by several libraries in South Sulawesi. This collaboration is an important part of the implementation strategy. Libraries in South Sulawesi must collaborate with educational institutions, such as universities and schools, to promote digital literacy and make the most of digital library resources. This collaboration will not only help libraries in developing literacy programs, but also expand the reach of library services to a wider community. In addition, establishing a regional network of digital libraries in South Sulawesi can help in sharing resources, experiences, and best practices between libraries, thereby encouraging faster growth and development in the implementation of digitalization.

This strategy will not succeed without the support of the government and supportive policies. Local governments must play an active role in supporting library digitalization by providing adequate budgets for the development of technological infrastructure, hardware procurement, and staff training. In addition, incentives and tax support can be given to libraries that invest in digitalization technology. This support will greatly help libraries in overcoming financial constraints which are often the main obstacles in the digitalization process. In addition, the government also needs to support digital literacy initiatives among the community by creating policies that encourage active community participation in programs organized by libraries.

d. Data management and system integration

The importance of data management and system integration in the library digitization process. Effective data management involves the use of digital library management software that can efficiently organize, manage, and track library collections. System integration allows libraries to combine various functions, such as cataloging, borrowing, and returning books, as well as inventory tracking, into one centralized digital platform. This not only improves operational efficiency, but also ensures that library data can be accessed in real-time and is well managed.

e. Community engagement

Community involvement is an important component in the implementation of library digitization. With digital libraries, people can more easily access various educational resources and information from anywhere and anytime. This infographic illustrates how libraries can host online events, such as book discussions, webinars, and workshops, that can be attended by a wide range of people regardless of geographical limitations. This not only improves access to information but also strengthens the role of libraries as learning centers and communities.

Overall, the implementation of the library digitization system in South Sulawesi requires a comprehensive approach and good coordination between various stakeholders. With the right strategy, libraries in the region can improve the accessibility, efficiency, and quality of their services, as well as contribute to increasing digital literacy in society. Support from the government, collaboration with other institutions, and active community participation are the keys to success in efforts to realize a modern and inclusive digital library in South Sulawesi.

**2. Impact on library services and public access to information**

The implementation of the library digitization system in South Sulawesi has a significant impact on library services and public access to information. Here are some of the key impacts that result from this digitalization:

a. Improved information accessibility

Library digitization allows the public to access information more easily and widely. Previously, access to library collections was limited to the library's operating hours and physical location. However, with a digital library, users can access their collection of books, journals, articles, and other resources anytime and from anywhere. This is especially beneficial for people in remote areas or those with limited mobility, who previously had difficulty physically reaching the library. Overall, the increase in accessing information increased by about 40% from the previous one.

b. Improved service efficiency

The digitization system makes various processes in the library more efficient. For example, searching and borrowing books that

previously took longer can now be done quickly through online catalogs. Users can check book availability, order, or borrow digital books directly without having to come to the library. This reduces waiting times and queues in the library, thereby improving the overall user experience. For the improvement in terms of service efficiency, it increased by around 47%.

c.  Expand the reach of the collection.

With digitalization, libraries can significantly expand the reach of their collections. Libraries are no longer limited by physical space in accommodating their collections. Digital books, journals, and articles can be accessed and stored without the need for physical storage space. This allows libraries to offer a wider range of collections, including international resources that may be difficult to obtain in print. The expansion of the collection reach to the community reached an average figure of around 42%.

d. Improving information literacy

Library digitization also plays a role in increasing information literacy among the community. Through easier access to educational resources and information, people can learn more and deepen their knowledge in various fields. Libraries can provide online tutorials, courses, and other educational materials that help people improve their digital skills and information literacy. This is especially important in the context of an increasingly complex digital world, where the ability to navigate digital information is crucial. The average public information literacy index increased by around 55%.

e. Increased community participation and engagement

With the existence of digital libraries, the community has become more actively involved in library activities. Libraries can hold a variety of online events, such as book discussions, webinars, and workshops, which can be attended by more people without geographical limitations. This increases community engagement with libraries and strengthens the library's role as a community hub that supports lifelong learning. The increase in community participation reached around 35%.

f.  Reduction of information gaps

Digitalization systems help reduce the information gap between people living in urban and rural areas. Digital libraries allow for more equitable access to information, even in areas that were previously difficult to reach by physical library services. With better access, people in remote areas can obtain the same information as those living in large cities, which in turn can help reduce social and economic disparities. In terms of reducing the information gap, it reaches an average of 42%.

g. Effectiveness and accuracy of library services

With a digital library management system, libraries can track and manage their collections more effectively. The digital system allows libraries to track *inventory* in *real-time*, manage borrowings and returns more accurately, and reduce administrative errors. In addition, users can also provide feedback directly through the digital *platform*, which allows libraries to continuously improve the quality of their services based on user feedback. The average figure in increasing the effectiveness and accuracy of library services reached 43%.

h.  Reduced operational costs

In the long term, digitization can help libraries reduce operational costs. Reduced requirements for physical storage space, reduced use of printed materials, and reduced labor costs for manual tasks such as archiving and document retrieval can provide significant savings. While there are considerable upfront costs for digitalization, such as hardware and software procurement, as well as staff training, the long-term benefits in the form of cost savings and increased operational efficiency can be substantial. In terms of reducing operational costs, it reached an average figure of around 37%.

i.  Support for distance learning

During the COVID-19 pandemic, distance learning has become very important, and digital libraries play a crucial role in supporting this process. Digitalization allows students and college students to access learning materials from home, including *e-books*, academic journals, and other resources. This helps ensure that the learning process continues despite physical restrictions. Support for distance learning by libraries reached an average of 52%.

j.  Ease of data collection and analysis

With digital systems, libraries can easily collect and analyze data about the use of their collections and services. This data can be used to make better decisions regarding the management

of the collection, the services offered, and future library development strategies. Libraries can understand usage trends, user needs, and areas that need improvement, so they can better respond to the needs of their communities. Libraries in South Sulawesi generally reach an average of 62% in terms of ease of data collection and analysis.



**Figure 1. The Impact of Library Digitalization**

Overall, library digitization in South Sulawesi has brought many positive impacts, both in terms of increasing access to information for the public and improving the efficiency and quality of library services. However, to maximize these benefits, it is important for libraries to continue to adapt to technological developments and the ever-changing needs of users. Digitalization is not the end goal, but a tool to achieve the greater goal of creating a society that is more educated, knowledgeable, and ready to face challenges in the digital era.

## Conclusion

Research on the implementation of the library digitization system in South Sulawesi shows that library digitization is an urgent need in facing the development of information and communication technology. This digitization provides a significant improvement in information accessibility, allowing people, especially in remote areas, to access library resources without being limited by distance and time. This wider access contributes to improving information literacy and supports lifelong learning, ultimately helping the region's sustainable development. However, the success of library digitization is highly dependent on the existing technological infrastructure, especially

the speed and stability of the internet connection, as well as the availability of adequate hardware such as computers and servers. Without the support of this infrastructure, digital systems cannot function optimally. In addition, the selection of the right digital library management software is also an important factor in ensuring library operational efficiency. The right software must be able to integrate various library functions, provide adequate technical support, and be easy for library staff to use. To support the implementation of digitalization, increasing the capacity of human resources through continuous training is also very necessary. Library staff must be prepared to face the challenges of ever-evolving technology and be able to provide better services to users. In addition, policy support from local governments and collaboration with educational institutions and local communities are very important to strengthen the implementation of library digitalization. This support includes the provision of adequate budgets, incentives for innovation, and the development of digital literacy programs for the community. The study also identifies that despite the many benefits offered by digitalization, there are challenges that need to be overcome, such as budget constraints, technological infrastructure gaps, and low digital literacy among the public. Therefore, a holistic and sustainable approach is needed, including greater investment in technology infrastructure, the development of digital literacy programs, and increased cooperation between libraries and related parties. Overall, this study concludes that library digitization in South Sulawesi is a crucial strategic step to strengthen the role of libraries as information and education centers in the digital era. With the right implementation strategy, libraries can improve the quality of their services and have a significant positive impact on the wider community, helping to reduce information gaps, and encourage the advancement of education and knowledge throughout the region.

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