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Challenges in Developing Digital Library Services and Strategies for Sustaining Physical Libraries at the South Solok Regency Library and Archives Agency

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Abstract

Regional public libraries face the dual challenge of expanding digital services while sustaining the accessibility and relevance of their physical collections. This study identifies systemic and technical barriers to digital library development, analyzes factors affecting digital service utilization and internal management, examines how collection classification inaccuracies affect information retrieval, and formulates an integrated strategy for sustaining physical library services. A descriptive qualitative approach with a single holistic case study design was employed at the Department of Library and Archives of South Solok Regency. Data were collected through in-depth interviews, observations, and documentation and analyzed thematically. The findings indicate that digital service development is constrained by unstable internet connectivity, server and system disruptions, limited budgets, inadequate human resources, the absence of accessible Online Public Access Catalog (OPAC) facilities, and insufficient user education. The sustainability of physical services is similarly affected by limited professional staffing and inaccurate collection classification and shelving, which impede information retrieval and reduce user convenience. These findings demonstrate that digital transformation cannot be separated from improvements in physical collection management and institutional capacity. The study contributes an integrated perspective that positions digital and physical services as complementary components of a hybrid library model. Practically, regional

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library planning should prioritize reliable infrastructure, staff capacity development, accurate collection organization, accessible discovery systems, and targeted service promotion according to institutional resources and user needs.

Keywords: Digital Library Services; Digital Transformation; Hybrid Libraries; Physical Libraries; Regional Public Libraries

INTRODUCTION

Public libraries have traditionally occupied an important position as institutions that provide access to information, education, research, cultural preservation, and lifelong learning for diverse segments of society. The increasing penetration of information and communication technologies, however, has fundamentally altered the way library users seek, access, and utilize information. Digital transformation has consequently encouraged libraries to move beyond conventional service models and develop digital environments capable of providing information without being constrained by geographical and temporal boundaries (Tjiptasari, 2022). This transformation is particularly important for public libraries because digital services can extend information access to potential users who may face limitations related to distance, time, physical mobility, or direct access to library facilities (Kristyanto, 2019). Nevertheless, digital transformation should not be interpreted as the complete replacement of physical libraries, because physical library spaces continue to provide educational, social, and informational functions that cannot be entirely reproduced through digital platforms (Nurhayati, 2018). The contemporary challenge for public libraries therefore lies not simply in adopting digital technologies, but in developing an appropriate balance between digital accessibility and the continued relevance of physical library services.

The importance of this balance becomes more apparent in regional public libraries, where technological transformation is often accompanied by limitations in infrastructure, human resources, funding, and user readiness. The development of digital library services requires more than the availability of digital collections because effective digital access also depends on technological infrastructure, information retrieval systems, and institutional capacity (Hartono, 2017). Previous research has demonstrated that digital library development may encounter technical, human-resource, and institutional problems that prevent digital services from functioning optimally (Iswanto, 2019). Similar challenges have been associated with unstable technological infrastructure, limited institutional preparedness,

and difficulties in adapting library services to changing user expectations (Nopriyanto, 2018). At the same time, digital library utilization is strongly influenced by users' digital competencies because technological facilities cannot generate optimal benefits when communities lack the knowledge required to use them effectively (Husna et al., 2021). Promotion and user education are therefore also necessary because the availability of digital services does not automatically guarantee community participation (Afifah & Santika, 2021).

These challenges are reflected in the context of the Dinas Perpustakaan dan Kearsipan Kabupaten Solok Selatan. The preliminary conditions described in the study indicate that the institution has not yet achieved an optimal and comprehensive digital service environment, particularly because of limitations in information-retrieval facilities and the absence of an adequate OPAC terminal for users within the physical library. Such conditions are problematic because an effective digital library requires an integrated environment in which electronic information can be accessed through an appropriate retrieval interface (Rodin, 2020). The situation is further complicated by limitations in network performance, system reliability, financial resources, and human resources, which may collectively restrict the development of digital services. The study also identifies limited numbers of professional library staff as an obstacle to maintaining consistent face-to-face services. The changing role of librarians in the digital environment consequently requires continuous development of technological, informational, and interpersonal competencies (Tyas, 2023). In addition, inconsistencies in the arrangement of physical collections can make information retrieval difficult for users who rely on direct browsing within the library.

The researchers position these conditions as evidence that digital transformation in regional public libraries should be understood as a systemic service transformation rather than a simple process of introducing technological applications. Digital library development is closely related to the availability of infrastructure, institutional resources, human competencies, funding, and the ability of users to engage with digital services (Liberni, 2022). The physical dimension of library services must also receive serious attention because the continued presence of organized collections and supportive physical spaces remains relevant to users' information-seeking experiences. Research comparing physical and digital information environments indicates that each format has particular advantages, suggesting that library development should consider their respective functions rather than treating them as mutually exclusive alternatives (Irfandari & Sa'diyah, 2024). Physical collections also possess cultural and historical value that cannot always be fully reproduced in digital form

(Anatara, 2024). Consequently, the researchers argue that the appropriate response to digital transformation is the development of complementary digital and physical services within a hybrid library orientation.

Existing studies have provided important insights into digital library development, but their research contexts and analytical emphases remain relatively fragmented. Iswanto, (2019), for example, examined problems in digital services at an Islamic higher-education library and identified technical, human-resource, and institutional constraints. (Rodin, 2020) discussed the preparedness and challenges of Islamic higher-education libraries in responding to the Fourth Industrial Revolution, particularly in relation to technological change and changing user behavior. These studies demonstrate that digital library development is multidimensional, but they do not specifically integrate the analysis of digital service problems with strategies for maintaining the physical library within the same regional public-library context. The gap is therefore not merely a difference in research location, but an analytical gap concerning how digital service constraints and physical-library sustainability can be understood as interconnected components of one library-service system. This distinction is important because the existing literature tends to emphasize either digital transformation or the challenges of maintaining library services, whereas the present study examines both dimensions simultaneously.

The novelty of this study lies in its integrative examination of digital-library development problems and physical-library preservation through a hybrid-library perspective. Rather than positioning digital and physical libraries as competing service models, this study conceptualizes them as complementary components that can collectively respond to heterogeneous information needs. The hybrid orientation is supported by the view that technological development should expand access while maintaining the functions and values provided by conventional library spaces. The study therefore connects four major dimensions of digital-library problems technology and infrastructure, human resources, policy and funding, and users with physical-library concerns involving space, collection organization, librarian services, and accessibility. The importance of maintaining physical library services is also supported by evidence that well-managed conventional services contribute to the quality of public library provision (Rudamin et al., 2025). Furthermore, collaboration and integrated information systems can strengthen the capacity of regional libraries to develop services according to local needs and available resources (Risparyanto et al., 2023). Within this framework, the study does not regard physical-library preservation as

resistance to digitalization, but as an essential component of a balanced transformation process.

The need for such an integrated approach is reinforced by the continuing importance of physical collections and library spaces. Problems in collection placement, shelving consistency, and physical accessibility can directly influence users' ability to locate information, particularly when digital retrieval facilities within the library are limited. The effectiveness of physical and digital libraries may also vary according to users' characteristics and information-seeking circumstances (Irmanda & Afriansyah, 2026). Meanwhile, digitalization itself introduces new challenges concerning collection development, copyright, preservation, and the long-term sustainability of electronic resources (Wahdah, 2020). These conditions indicate that the development of a regional library cannot rely exclusively on one service channel. Instead, the institution requires coordinated management of digital infrastructure, physical collections, human resources, user education, and service innovation.

The present study therefore focuses on identifying and describing the systemic and technical problems encountered in developing digital library services at the Dinas Perpustakaan dan Kearsipan Kabupaten Solok Selatan, examining factors associated with the limited utilization of digital services, analyzing internal constraints affecting physical library services, and examining the implications of inaccurate or inconsistent collection arrangement for users' information retrieval. The study further seeks to formulate an integrative strategy that can strengthen digital services while maintaining the relevance and accessibility of the physical library. This focus is consistent with the broader need for regional libraries to respond to technological change while continuing to fulfill their social and educational responsibilities (Mappatunru & Sumarto, 2025). In practical terms, the study is expected to provide an empirically grounded basis for prioritizing infrastructure improvement, OPAC provision, human-resource development, collection organization, user education, and collaboration with relevant stakeholders. The ultimate objective is to formulate a service orientation in which digital and physical facilities operate progressively and complementarily rather than developing as separate or competing systems. Such an approach is expected to contribute to a more context-sensitive understanding of hybrid library development in regional public-library institutions, particularly those operating under resource limitations and serving communities with diverse levels of digital readiness.

METHODS

This study employed a descriptive qualitative approach using a single holistic case study design to examine the problems associated with digital library service development and the strategies for sustaining physical library services at the Department of Library and Archives of South Solok Regency. The qualitative approach was selected because the study sought to understand the phenomenon in its natural setting and to describe the experiences, conditions, and perspectives of stakeholders without experimental intervention. The case study design focused on a single institutional unit, allowing the researcher to examine the interaction between digital service development, physical library management, user needs, and institutional constraints within their actual context (Miles & Huberman, 2014). The study was therefore aligned with its objectives of identifying digital service problems, examining factors underlying limited digital service utilization, analyzing obstacles in maintaining physical services, and formulating an integrated strategy for both service modes (Sugiyono, 2021).

The research design was guided by four theoretical areas developed in the thesis: physical library functions, digital library services, problems in digital library development, and strategies for sustaining physical libraries. These theoretical areas were operationalized into indicators corresponding to the research focus. The digital library problem indicators covered software and database infrastructure, the availability of an Online Public Access Catalog (OPAC), digital infrastructure readiness, and users' digital literacy and virtual-service awareness. The physical library indicators included internal management constraints, limitations in professional library staff, supervision of circulation services, and the effects of inaccurate classification and shelving on users' access to collections. An additional integrative focus addressed local budget allocation, hybrid-library service strategies, and users' expectations regarding information access.

Participants were selected through purposive sampling because the study required informants who directly understood or experienced the services under investigation. The thesis identified 10 informants consisting of four key informants from the library management side one head of department, one head of the library division, and two librarians or technical staff and six supporting informants who were active library users. Informants were selected because they interacted directly with the library environment, had knowledge or experience of operational constraints and digital-service transition, and were willing to

provide relevant information. The use of purposive sampling is also methodologically consistent with (Zain & Asmara, 2026), who selected participants purposively according to the characteristics required by their research objectives, although their study employed a quantitative correlational design.

The researcher served as the primary instrument or human instrument, supported by a semi-structured interview guide, voice recorder, digital camera, and field notes. The interview guide was developed from the research indicators and subjected to expert judgment by the thesis supervisor. Data were collected through in-depth interviews, participant observation, and document analysis. Interviews were conducted through pre-interview preparation, face-to-face interviewing, probing, audio recording, and member checking. Observation was used to examine physical infrastructure, service activities, social interactions, and user behavior, while documentation was used to verify primary findings through institutional planning, implementation, evaluation, and policy documents. Data validity was strengthened through source and methodological triangulation, complemented by credibility, transferability, dependability, and confirmability procedures. The data were analyzed thematically by reading and understanding the collected materials, coding relevant information, grouping similar codes into themes, reviewing the themes against the data, and determining the final themes. Data organization, presentation, and conclusion verification were also considered in accordance with (Sugiyono, 2021). The resulting themes were interpreted according to the research focus on digital library problems and physical library sustainability.

The study was conducted at the Department of Library and Archives of South Solok Regency, located in Nagari Lubuk Gadang, Sangir District, South Solok Regency, West Sumatra. The thesis documents the administrative entry process and field data-collection procedures but does not explicitly state the calendar month/year or total duration of the research; therefore, these details are not added to avoid introducing information unsupported by the source.

RESULTS

The analysis of interview, observation, and documentary data identified three major thematic areas concerning the development of digital library services and the sustainability

of physical library services at the Department of Library and Archives of South Solok Regency. The findings indicate that the challenges faced by the institution are not attributable to a single factor, but emerge from the interaction of technological infrastructure, financial capacity, human resources, user readiness, collection management, and service strategies. The findings are organized into three themes: (1) constraints in developing digital library services, (2) challenges in sustaining physical library services, and (3) an integrative strategy for strengthening digital and physical services.

Constraints in Developing Digital Library Services

The first theme concerns the structural and operational constraints affecting the development of digital library services. Four interconnected issues emerged from the data: technological and network limitations, budget constraints, limited human resources and digital competencies, and the relatively low utilization of digital services by the community. The overall pattern of findings is presented in Table 1.

Table 1. Major Constraints in Digital Library Service Development

Dimension	Empirical Finding	Service Implication
Technology and network infrastructure	Unstable internet connectivity, server and InlisLite disruptions, slow access, and the absence of an OPAC terminal	Restricted access to and retrieval of library information
Budget	Limited financial resources must be distributed across operational, maintenance, collection, annual program, and service-development needs	Digital infrastructure and other service improvements cannot be implemented optimally
Human resources	Limited numbers of librarians and technical personnel; staff rotation is required to maintain service coverage	Reduced service capacity and continuing need for digital competency development
User readiness	Digital services have not experienced significant growth in utilization; users have different levels of understanding and access experience	Existing digital facilities have not yet been fully translated into increased service utilization
Technology and network infrastructure	Unstable internet connectivity, server and InlisLite disruptions, slow access, and the absence of an OPAC terminal	Restricted access to and retrieval of library information

Source: Processed Primary Data, 2026

According to Table 1. Major Constraints in Digital Library Service Development, Technological limitations included unstable internet connectivity, disruptions to the server and InlisLite system, and the absence of a dedicated computer-based OPAC, which restricted users' independent access to library resources. Financial constraints further limited digital transformation, as available funds had to be allocated across routine operations, facility and

collection maintenance, annual programs, and service development, thereby reducing the resources available for digital infrastructure and human-resource capacity. Human-resource constraints were also evident, with limited personnel requiring a rotating duty system to sustain basic circulation and information services while simultaneously adapting to the demands of digital operations. In terms of utilization, the digitalization program had not generated a substantial increase in digital service use, despite the absence of a significant decline in overall library users. Variations in users' digital literacy, together with limited orientation and promotion of digital services by the library, contributed to continued reliance on physical services. Overall, these findings suggest that the effectiveness of digital library development depends on the integration of reliable technological infrastructure, adequate financial and human resources, and systematic efforts to promote users' engagement with digital services.

Challenges in Sustaining Physical Library Services

The second theme concerns the conditions affecting the sustainability and usability of the physical library. Two prominent issues emerged: limitations in human-resource availability and inaccuracies in collection shelving. These problems were particularly relevant because users continued to depend on physical collections and direct assistance from library staff.

Table 2. Challenges Affecting Physical Library Sustainability

Aspect	Finding	Observed Consequence
Human-resource availability	Limited number of librarians and service personnel	Occasional gaps in circulation services and longer assistance processes
Service supervision	Staff rotation is used to maintain service availability	Operational continuity is maintained, but staffing limitations remain
Collection shelving	Books were not consistently placed according to their classification numbers	Users experienced difficulty and required more time to locate materials
Collection accessibility	Absence of an OPAC increased dependence on manual searching	Accurate shelving and clear shelf labeling became increasingly important
Human-resource availability	Limited number of librarians and service personnel	Occasional gaps in circulation services and longer assistance processes

Source: Processed Primary Data, 2026

Based on Table 2. Challenges Affecting Physical Library Sustainability, Staff shortages affected service continuity, particularly in the circulation area, while the rotation system provided only a temporary solution and could not fully address delays in user

assistance. Collection organization was also problematic, as some books were not consistently shelved according to their classification numbers. In the absence of a dedicated OPAC terminal, users relied on manual searches, making inaccurate shelving a significant barrier to efficient resource discovery. These findings indicate that the sustainability of physical library services depends not only on the availability of printed collections but also on their accessibility and systematic organization. Nevertheless, continued requests for updated and relevant materials, particularly novels and comics, demonstrate that printed collections remain important to users. Thus, digital transformation has not diminished the relevance of physical collections; rather, their continued value requires systematic organization, labeling, maintenance, and collection development.

Integrative Strategies for Digital and Physical Library Services

The third theme concerns the strategies identified from the perspectives of library managers, staff, and users. The findings indicate that the appropriate response is not to replace physical services with digital services, but to develop both service dimensions in a complementary manner. The principal strategies identified from the data are summarized in Table 3.

Table 3. Integrative Strategies for Library Service Development

Strategic Area	Proposed Strategy	Expected Function
Digital infrastructure	Improve internet connectivity, maintain servers, and provide OPAC facilities	Improve accessibility and information retrieval
Human resources	Strengthen staffing and continuously develop digital competencies	Improve service continuity and staff capability
Physical collections	Reorganize collections according to classification, improve shelf labeling, and maintain collections	Improve discoverability and user convenience
Collection development	Provide relevant and updated printed materials	Maintain the attractiveness and relevance of physical services
User engagement	Strengthen promotion, education, and digital-service orientation	Increase awareness and utilization of digital services
Institutional collaboration	Develop cooperation with schools and other relevant stakeholders	Expand outreach and literacy activities
Service integration	Implement a gradual hybrid-library model	Integrate digital accessibility with the continuing role of physical services
Digital infrastructure	Improve internet connectivity, maintain servers, and provide OPAC facilities	Improve accessibility and information retrieval

Source: Processed Primary Data, 2026

Table 3. Integrative Strategies for Library Service Development show that The findings indicate that users continue to value printed collections and physical reading spaces

while also expecting improved digital access through OPAC facilities and reliable internet connectivity. Accordingly, strengthening physical services requires systematic collection management, including the provision of relevant materials, classification-based shelving, clear labeling, and regular maintenance, particularly where digital retrieval remains limited. Human-resource strengthening is equally important, as the existing rotation system serves only as a short-term operational response to staffing shortages, while adequate staffing and competency development are needed for long-term service sustainability. Collaboration with educational institutions and intensified promotion can further expand community engagement by introducing users to both physical and digital services and strengthening their digital information-literacy skills. Overall, the findings demonstrate that digital and physical services are complementary rather than mutually exclusive. Key priorities include improving technological infrastructure, providing OPAC facilities, strengthening staff capacity, organizing and updating collections, and expanding digital-service promotion and education. These priorities support a gradual hybrid-library development model that integrates physical and digital services according to users' needs and institutional capacity.

DISCUSSION

The findings demonstrate that the challenges in developing digital library services at the Department of Library and Archives of South Solok Regency are multidimensional and interconnected. Inadequate digital infrastructure, unstable connectivity, limited financial resources, insufficient human resources, and uneven user readiness collectively shape the service environment. Digital transformation therefore requires more than technological provision; it depends on the alignment of infrastructure, organizational capacity, financial support, staff competence, and user engagement. The absence of an OPAC terminal, for instance, limits users' ability to independently discover and locate information, indicating that technological adoption without adequate user-oriented infrastructure does not necessarily improve information accessibility.

Financial capacity also plays an important role in sustaining digital services. Budget constraints affect the provision and maintenance of digital infrastructure, collection development, and human-resource development, indicating that digitalization is closely related to institutional prioritization. Similarly, the rotating duty system helps maintain service continuity amid staff shortages but functions primarily as a short-term adaptation rather than

a structural solution. These conditions show that digital-service sustainability depends not only on technology but also on sufficient organizational and human-resource capacity.

The findings further indicate that limited digital-service utilization should not be attributed solely to users' digital literacy. While some users had received digital-literacy education through schools or universities, others had limited orientation from the library. This suggests that digital-service utilization is shaped by both user readiness and institutional communication. Consequently, promotion, orientation, and digital education should be regarded as integral components of service development rather than supplementary activities.

The sustainability of physical library services remains equally important. Users continue to depend on printed collections, reading spaces, and direct assistance, although these services are affected by staffing limitations and inaccurate shelving. Misplaced collections increase the effort required to locate information, particularly when digital discovery facilities are incomplete. Thus, weaknesses in digital retrieval increase the importance of systematic physical collection management, suggesting that physical-library sustainability concerns not only the preservation of collections but also their accessibility and usability.

The findings largely support and extend previous studies. (Iswanto, 2019) emphasizes infrastructure readiness, which is supported by the observed effects of unstable connectivity, system disruptions, and the absence of an OPAC terminal. However, this study extends the discussion by demonstrating that technological constraints are closely linked to financial and human-resource conditions. Similarly, the findings reinforce Arum & Marfianti (2021) and Husna et al., (2021) regarding the importance of introducing and developing digital services, while further showing that limited utilization reflects not only users' technological capabilities but also the effectiveness of institutional outreach and orientation. This is consistent with Afifah & Santika (2021), who highlight library promotion as an important mechanism for increasing awareness and service utilization.

The findings also support Tjiptasari (2022), which views the transition from conventional to digital libraries as a gradual process in which physical services remain relevant. Users' continuing demand for printed collections and reading spaces, alongside expectations for improved digital access, indicates that digitalization should not be understood as replacing physical services. In addition, the findings are consistent with Anatara (2024), who emphasizes systematic collection organization. This study extends that

perspective by showing that accurate shelving becomes particularly important when digital discovery facilities are incomplete, allowing effective physical organization to compensate partially for technological limitations.

The findings further strengthen the hybrid-library perspective proposed by Hartono (2017), Nopriyanto (2018), and Rudamin et al. (2025). The simultaneous demand for printed collections, physical spaces, OPAC access, and reliable internet demonstrates that physical and digital services address complementary user needs. Theoretically, this study therefore conceptualizes digital transformation as an organizational and socio-technical process in which financial resources influence infrastructure and staffing, infrastructure affects accessibility, staffing supports service continuity, and user education shapes digital-service utilization. Assessing digital-library maturity solely through the availability of digital platforms is consequently insufficient; technological readiness, organizational resources, staff capability, collection management, and user engagement must be considered together.

Practically, the findings suggest several priorities for institutional management, including improving internet connectivity and server maintenance, providing an OPAC terminal, strengthening staffing and digital competencies, and improving collection organization through accurate classification, shelf labeling, maintenance, and relevant collection development. The existing rotation system may remain useful as a short-term measure but should not replace longer-term efforts to strengthen staffing capacity. At the policy level, digital transformation requires integrated planning and budget allocation across infrastructure, maintenance, human resources, collection development, and user education. Collaboration with educational institutions, government agencies, universities, local communities, and literacy organizations may further strengthen institutional capacity.

The principal contribution of this study lies in linking digital-library development with the sustainability of physical library services within a regional institutional context. Rather than viewing digitalization as a linear transition from physical to digital services, the findings support an integrated model in which technology, people, collections, user education, and organizational management are developed simultaneously. Nevertheless, the qualitative case-study design and focus on a single public library limit statistical generalizability. The findings should therefore be interpreted primarily as contextual insights. In addition, digital-service utilization and digital-literacy competence were not quantitatively measured, meaning that related findings reflect participants' experiences rather than

statistical estimates. Future research could strengthen these findings through longitudinal observation, quantitative utilization data, or comparative studies across regional libraries.

CONCLUSION

This study concludes that the development of digital library services at the Department of Library and Archives of South Solok Regency remains constrained by interconnected infrastructural, financial, human resource, and user-related factors. Unstable internet connectivity, server and InlisLite disruptions, limited digital facilities, and the absence of an accessible OPAC have restricted the effectiveness of digital information retrieval. These conditions are further influenced by budget limitations, limited staff capacity, and insufficient public education regarding the use of digital library services. At the same time, the sustainability of the physical library is affected by limited professional staffing and inaccuracies in the classification and shelving of collections, which reduce the efficiency and convenience of information retrieval for users. These findings directly answer the research objectives by demonstrating that digital service development and physical library sustainability are not separate challenges but interconnected aspects of library service management.

The principal contribution of this study lies in its integrated perspective on digital transformation and physical library sustainability within a regional public library context. Rather than positioning digital services as a replacement for physical facilities, the findings emphasize the importance of developing both as complementary components of a hybrid library service model. This perspective provides practical value for institutional planning, particularly in establishing development priorities according to available resources and user needs. The institution should prioritize improvements in internet connectivity and system maintenance, provision of OPAC facilities, collection organization, librarian capacity, and digital service promotion and education. Future development should also strengthen collaboration with schools, village governments, higher education institutions, technology-related agencies, and literacy communities. Further research is recommended to examine user experiences and digital service utilization more deeply and to compare hybrid library development across several regional libraries.

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