

LOCAL COMMUNITY-BASED DIGITAL LIBRARY SERVICES

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Abstract

This study explores community-based digital library services in Bone Regency, South Sulawesi, focusing on how participatory design and user needs mapping shape innovation and impact. Using a qualitative case study with 15 informant. data were collected gathered through observation, semi-structured interviews and document analysis. Findings show that digital libraries have introduced service innovations such as online portals, mobile applications, and digitized local knowledge developed through active user participation and periodic evaluation. The services are used for academic, research, and community literacy purpose but challenges persist, including infrastructure constraints, low digital literacy, and limited human resources. Despite these constraints, the services foster improved access to information, cultural preservation, and stronger community collaboration. The novelty of this study lies in integrating Community-Based Design and Information Needs Assessment to highlight how rural digital libraries can become inclusive, innovative, and sustainable. Practical implications and directions for further research are also discussed to encourage the development of more inclusive, innovative, and sustainable digital library services.

Keywords: *Digital Libraries, Community Needs, Digital Literacy, Service Innovation, User Participation*

INTRODUCTION

The transformation of library services toward digitalization has become a priority agenda in many countries, including Indonesia, in response to the demands of the information age and the strengthening of digital literacy among the public (King, 2020; Onunka et al., 2023; Palmer, 2022). Public libraries are encouraged to adapt to inclusive and relevant digital learning centers that meet the needs of users (Meesad & Mingkhwan, 2024; Rahmanova, 2025). At the same time, dynamics in rural areas such as Bone Regency, South Sulawesi, reveal that the adoption and utilization of digital library services still face fundamental challenges, particularly

in terms of accessibility and relevance for local communities ((Hazan & Ayub, 2024; Herianti et al., 2023)

Several studies confirm that despite the development of digital library infrastructure and applications, utilization by the public remains suboptimal (Abidin & Eriyadi, 2024; Kustanti & Ulfah, 2017; Ramadhan, 2023; Ridha & Kusasi, 2024; Sudradjat, 2019). For example, surveys in various cities found that only around 20% of respondents used the iPusnas application, despite 39% being aware of its existence (Kustanti & Ulfah, 2017; Tinur, 2021). This indicates a gap between the availability of services and the specific needs of users at the community level, particularly in rural areas and regions with limited digital literacy access.

Hazan & Ayub's (2024) and Herianti et al.' (2023) highlight the low level of community participation in digital library services in Bone Regency, caused by limited contextualized content, user-unfriendly language, and lack of basic digital literacy support. In addition to content relevance issues, the design process is still dominated by a top-down approach that minimizes community involvement (Delliana, 2025; Saputra & Desriyeni, 2024). This results in services that are less adaptive to socio-cultural characteristics, leading to low adoption and effectiveness. A participatory community needs-based approach is therefore urgently needed in the development of digital library services, especially in rural areas.

Despite infrastructure development and service innovation, three interrelated issues persist: (1) limited user participation in service design and evaluation, (2) weak alignment of services with the diverse needs of rural communities, and (3) barriers related to infrastructure, human resources, and digital literacy. These challenges demonstrate a critical gap between technology integration and the social relevance of services. Therefore, this study adopts Community-Based Design (CBD) as the main problem-solving framework, which positions the community as the central actor in the design and evaluation process of digital library services (DiSalvo et al., 2012; Simonsen & Robertson, 2013). CBD emphasizes the importance of active participation, exploration of socio-cultural needs, collaboration in developing solutions, and reflection on the benefits of services from the community's perspective. In addition, the Information Needs Assessment Framework (INAF) (Case & Given, 2016) is also integrated to explore the aspects of "when," "how," and "why" people need digital information. This combined approach enables an in-depth exploration of the relevance, accessibility, and potential impact of digital library services for user communities in a contextual manner.

Literature over the past decade has largely focused on technical aspects, system efficiency, and internal institutional challenges in the digitization of public libraries, particularly in urban areas (Baryshev et al., 2020; Winoto & Sukaesih, 2021). Efforts to address user participation and community-based information needs have begun to be explored, but most studies remain descriptive and lack a systematic conceptual framework (Heriyati et al., 2021; Veronika, 2023). Hazan (2024) has identified challenges in integrating information technology in Bone but has not focused on mapping the real needs of the local community.

RESEARCH METHOD

This study uses a qualitative approach with a case study design, which was chosen to explore in depth how community-based digital library services were developed and accessed by the community in Bone Regency, South Sulawesi. Case studies enable researchers to understand the dynamics, experiences, and real practices that occur in specific social and cultural contexts,

thereby providing a comprehensive picture of the issues faced by communities using digital library services (Yin, 2018).

The research was conducted at the Bone Regency Library, which was chosen because it has implemented digital services but continues to faces various challenges in utilization and community involvement. Fifteen informants were purposively selected to represent three main groups: (1) librarians directly involved in digital service management, (2) active users from diverse community backgrounds (students, teachers, farmers, homemakers, and MSME actors), and (3) local stakeholders such as community leaders. Selection criteria included experience in using or managing digital library services, willingness to participate, and ability to provide insights into community needs. Efforts were made to ensure demographic diversity in terms of age, gender, occupation, and education level. Data collection was continued until thematic saturation was reached, where no new themes emerged during interviews.

Data collection combined semi-structured interviews, direct observation, and document analysis. Interview guides were developed based on indicators of information needs, content relevance, and user participation. Each interview lasted 45–60 minutes and was audio-recorded with consent. Field observations captured user behavior, interaction patterns, and infrastructure use. Supporting documents such as library policies, annual reports, and service statistics were also analyzed to triangulate findings.

Thematic analysis was applied using the interactive model of Miles et al. (2019), consisting of data reduction, presentation, and conclusion drawing with NVivo software to organize and code data systematically. In the data reduction stage, researchers selected and sorted data based on main themes that had been determined by the problem formulation and the Community-Based Design and Information Needs Assessment Framework (Case & Given, 2016; Simonsen & Robertson, 2013). The reduced data is then presented in the form of thematic narratives and conceptual matrices to facilitate the identification of patterns, relationships between themes, and differences or similarities in the informants' perspectives. The conclusion-drawing process is conducted iteratively by interpreting emerging patterns, comparing them with theory and previous research findings, and verifying the analysis results through triangulation of data sources, data collection techniques, and the timing of data collection. Thematic coding and the key quotes that emerged from the data are summarized in Table 1.

Table 1. Thematic coding and the key quotes found

Main Theme	Data Source	Key Quotes
Design & Innovation of Digital Services	All Informants	<i>"Online portal, mobile application, OPAC, e-repository, weblog, digital catalog..."</i> <i>"Needs assessment through surveys and analysis of usage data."</i>
Utilization & User Experience	All Informants	<i>"Digital services greatly support publication, easy access, relevant content."</i> <i>"Upon entering the library, visitors immediately access computers for digital information."</i>
Challenges & Implementation Barriers	All Informants	<i>"Lack of understanding of digital services, limited HR for promotion, infrastructure constraints."</i> <i>"Content is sometimes less appealing, and collections still need to be aligned with user needs."</i>
Adaptation,	All Informants	<i>"Regular evaluation, adaptation based on user feedback,</i>

Evaluation & Service Improvement		<i>feature innovation.</i> <i>"User comments on the website & social media are followed up for service improvement."</i>
User Participation & Community Engagement	All Informants	<i>"Users are involved through workshops, surveys, online feedback, discussions, and demos."</i> <i>"The library actively involves users via online surveys, suggestion boxes, and social media."</i>
Social Impact, Relevance & Expectations	All Informants	<i>"Digital services have become a bridge for local literacy & the younger generation, positive impact on community literacy."</i> <i>"Expectation: services become increasingly inclusive, innovative, and truly based on real user & community needs."</i>

The validity and reliability of the data in this study were ensured through the application of source triangulation, which involved comparing data from librarians, users, and stakeholders; technique triangulation, which combined interviews, observations, and document studies; and time triangulation, which involved confirming data at different times to ensure the consistency of findings. Additionally, member checking was conducted by requesting confirmation and clarification from several key informants regarding the data interpretation performed by the researcher. All stages of this research were carried out by research ethics principles, such as informed consent, anonymity, and confidentiality of informant identities and data, ensuring that the rights and comfort of participants were safeguarded throughout the research process.

RESULT AND DISCUSSION

Theme 1: Digital Service Design and Innovation

Digital library services in Bone Regency are innovatively designed using various platforms and features, ranging from online portals and mobile applications to OPAC. The development process of these services does not only rely on technology but also emphasizes the importance of mapping user needs through surveys, discussions, and usage data analysis. In addition, service innovation is carried out by taking into account local culture and the needs of the younger generation, for example, through the digitization of South Sulawesi's local knowledge collections and the presentation of visually appealing content. The form and design of the available digital service innovations can be seen in the following script.

"Through the online library portal/official website, mobile library application, and online catalog (OPAC – Online Public Access Catalog)." (SU)

"In my opinion, the structure and types of digital services currently provided are in accordance with the SOP in implementing digital-based services." (AZ)

"The structure is functional because it covers general services and digital services... The types of digital services provided are OPAC and electronic-based circulation services." (MF)

"Providing access to the library's digital collections, including books, articles, journals, and other resources... The digital collection is designed to be easily accessible to library visitors." (LN)

"A website or special portal that provides access to information, announcements, and services. It can be accessed via computers and mobile devices." (MS)

Meanwhile, the user needs a mapping script as follows.

"Of course, before designing digital services, we must first map the needs of the community in various aspects so that they are structured." (AZ)

"Yes, in the process of designing and developing digital services, we conduct a mapping of community needs... Our main focus is on how these digital services can serve as an information bridge, especially for the millennial generation, so they can better understand their cultural roots and local wisdom." (DS)

"Collecting data on user needs and preferences through surveys and questionnaires. Analyzing user data to understand user needs and conducting usability testing of digital services..." (LN)

"Usually, we map the needs of the user community to ensure that the services provided are relevant and effective. Although I do not have direct access to internal documents, the process generally involves observing and analyzing data on the use of existing digital services, including the most frequently used and least frequently used features, and looking at best practices from other libraries, both domestic and international..." (MS)

These findings indicate that libraries in Bone Regency have made systematic efforts to design and develop digital services, integrating relevant technologies and responding to community needs. Rather than relying solely on technological innovation, the development process prioritizes local needs, both through needs assessment before design and the adaptation of content based on cultural and digital generation considerations. These practices strengthen the position of libraries as adaptive, relevant, and inclusive learning institutions in the digital age. Diverse service designs and locally-based innovations promote increased access, engagement, and relevance of digital libraries for the broader community.

Theme 2: Utilization and User Experience

The utilization of digital library services in Bone Regency has reached the majority of the community and students. Users utilize these services for various purposes, such as searching for book references, articles, scientific journals, and final project requirements. Digital services are considered very helpful in learning and research activities while also strengthening digital literacy. In addition to ease of access and relevance of content, users also appreciate the completeness of the digital collection. However, some users still experience technical challenges, such as access disruptions due to system maintenance or limited internet infrastructure. The following interview results reinforce this.

"The digital service I often use is the web resources service from the Indonesian National Library website. I need articles from journals indexed by Scopus... The digital services I often use are very helpful in completing my publications." (WA)

"Books on politics, science, and technology... I think they are very suitable for my needs. The e-repository (website) is interesting because I can easily find the information I need." (MF)

"In general, the available digital services are sufficient for reference needs and very easy to use." (KM)

"When visitors come to the library, they are faced with computers, which serve as the access point for visitors to the library." (Observation, Day 3)

"While in the library, there are several digital media available such as an online catalog, educational videos, and reference databases." (Observation, Day 2)

"Although there are occasional access difficulties, such as messages like 'under maintenance' or 'currently being updated.'" (AW)

These findings show that the digital transformation of libraries has had a real impact on the community and users in Bone Regency. Digital services are considered an increasingly important need and are very helpful in academic activities and literacy development. High utilization rates, ease of access, and the relevance of content indicate the library's success in providing services that meet user expectations. However, the findings also highlight the importance of improving infrastructure quality and support systems, given the technical challenges still faced by some users. Therefore, ongoing improvement efforts are necessary to ensure that digital library services are truly optimal, inclusive, and sustainable.

Theme 3: Challenges and Obstacles in Implementation

The implementation of digital library services in Bone Regency faces a number of challenges and obstacles, both internal and external. The main problems include low digital literacy among some users, limited human resources, particularly in the field of digital promotion, and technological infrastructure barriers such as unstable internet access and limited hardware. In addition, the promotion strategy is still personal and has not become a structured institutional program. In terms of content, the available digital collections are sometimes considered monotonous uninteresting, and do not fully meet the priority needs of library users. The following interview excerpts are some of the evidence found in the field.

"The challenge is that library users lack understanding of the services provided by the library." (SR)

"The main challenge is identifying the priority needs of the community in searching for digital-based information." (AZ)

"Limited human resources. One of the most significant challenges is the limited number of librarians who are specifically focused and consistent in introducing and promoting the collection."

So far, digital services have been promoted through personal initiatives, such as sharing links or content through personal social media accounts (Facebook) or WhatsApp groups for librarians. Although this method is quite helpful in reaching certain communities, its reach is limited and not yet integrated into an institutional digital promotion strategy." (DS)

"The challenges include competition with other more attractive technologies such as social media and infrastructure limitations such as weak internet networks, which hinder access to digital services." (LN)

"The lack of professionals skilled in IT and digital service management can slow down the development and maintenance of services. In addition, the development of relevant and comprehensive digital collections requires budget and cooperation with resource providers." (MS)

"The content of the services provided is unattractive, too monotonous, and the collections are still lacking and do not meet the needs of the community." (MF)

These diverse challenges indicate that the success of library digitization does not only depend on the availability of technology but also the readiness of human resources, effective promotion strategies, and careful development of digital content. Digital literacy barriers and promotion that are not yet institutionally structured have the potential to limit the reach and

effectiveness of services. Infrastructure constraints reinforce the need for investment and collaboration in technology development. Additionally, the development of relevant, diverse, and engaging digital collections must be a priority to ensure services remain responsive to community needs. By addressing these challenges comprehensively, digital libraries can become more inclusive and highly competitive tools in the era of digital transformation.

Theme 4: Adaptation, Evaluation, and Improvement of Services

The digital library in Bone Regency actively evaluates and adapts its services to ensure effectiveness, relevance, and user satisfaction. Evaluations are conducted regularly, both monthly and semi-annually, using visit data, user feedback, and trends in the needs of the younger generation. Evaluation results are used to improve, enrich, and adjust digital service features such as collection descriptions, visual displays, and multi-platform access. Additionally, the library provides opportunities for active user participation through surveys, workshops, and comment sections on its website and social media platforms to promote sustainable and responsive service development. The following interview script demonstrates the evaluation process.

"There is an evaluation every six months, looking at the evaluation results and adjusting what users might need." (SU)

"There must always be regular evaluations to measure the extent of the benefits of using digital services." (AZ)

"Generally, the library conducts regular evaluations of digital service usage to ensure that services remain relevant and effective." (MS)

"Regular evaluation and monitoring, collection adjustments, features & online consultation, continuous innovation based on feedback." (KM)

Meanwhile, the process of adapting and improving services is carried out through the following indicators.

"The adaptation process to user needs in digital services is carried out gradually... We display user comments, both those submitted through the comment section on the website and from direct interactions... If users want additional information on a particular collection, we immediately follow up." (DS)

"My suggestion is that digital services should be developed because of the rapid development of technology; they must be up to date at all times." (MF)

These findings indicate the existence of a culture of continuous evaluation and adaptation in the management of digital library services. Regular evaluations enable libraries to detect new user needs and trends so that service improvements and developments can be targeted appropriately. User involvement through feedback, surveys, or workshops reinforces the principle of community-based services while ensuring that innovations remain relevant and in demand. This approach drives the transformation of digital libraries to stay adaptive, innovative, and capable of keeping pace with technological advancements and the expectations of the digital generation.

Theme 5: User Participation and Community Involvement

Active participation of users and the community is one of the important factors in the development of digital library services in Bone Regency. Although user involvement is not yet optimal, various initiatives have been taken to open up space for dialogue and collaboration, including workshops, seminars, online surveys, training activities, and discussions on digital

literacy. Various communication channels, such as suggestion boxes, social media, and discussion forums, are used to collect input and aspirations from the community. This community involvement encourages libraries to continuously adapt and develop digital services to be more relevant, participatory, and based on local needs. Several statements from stakeholders and users are summarized below.

"Yes, at certain moments, such as workshops, seminars, discussions, and so on." (AZ)

"I have been asked for input on the development of digital services." (SS)

"There are almost always development activities every month, such as seminars, training sessions, workshops, and others." (ZA)

"The library actively involves users in service development, such as opening communication channels like online surveys, suggestion boxes, and social media platforms for feedback." (KM)

"Users or patrons participate in every demo or seminar held by the library." (Observation, Day 3)

"They participate in discussions and provide suggestions related to the services available at the library." (Observation, Day 1)

"The library must be active in promoting services and providing interesting entertainment to attract visitors/library users so that they are more participatory in the services provided." (FM)

These findings confirm that user and community involvement in the development of digital library services has begun to grow, although not yet optimally. The presence of participatory forums, both online and offline, enables the community to contribute to improving service quality. Through feedback from various communication channels, libraries gain a deeper understanding of users' needs and expectations. Collaboration through various joint activities also strengthens the community's sense of ownership toward the digital library. To achieve truly responsive and inclusive services, libraries need to continue expanding and optimizing participation spaces and strengthening two-way communication with the community.

Theme 6: Social Impact, Relevance, and Expectations

Digital library services in Bone Regency have had a significant social impact, particularly in improving digital literacy and access to information among the community, including the younger generation and local communities. In addition to supporting research and education, these services also play a role in preserving local knowledge and encouraging collaboration among community members. With the development of technology and the increasingly dynamic needs of the community, there are high hopes that digital library services will become more inclusive, innovative, and truly based on the real needs of users and the community. The following statements evidence this theme.

"These digital services serve as a bridge of information, especially for the millennial generation, so that they can become more familiar with their cultural roots and local wisdom." (DS)

"In my opinion, it has a positive impact on community literacy, as it provides information services to enhance literacy among various segments of the general public, such as community literacy. Additionally, libraries should actively promote their services and offer engaging entertainment to attract visitors/library users, thereby encouraging them to participate more actively in the services provided." (FM)

"Digital libraries significantly contribute to improving community literacy, especially digital literacy and access to information. However, it is important to remember that this can only be achieved with guidance and training." (KM)

"Our main focus is on how these digital services can serve as a bridge of information, especially for millennials, so that they can better understand their cultural roots and local wisdom." (ZA)

These findings show that digital library services not only facilitate access to information but also contribute significantly to strengthening literacy and preserving culture at the community level. The existence of adaptive digital services increases opportunities for young people to learn about, understand, and preserve local knowledge that has been poorly documented. Additionally, collaboration and community participation become easier to achieve through inclusive and innovative digital access. The hope for the future is that digital libraries will continue to evolve with increasingly participatory, responsive, and relevant approaches to the dynamic needs of society so that the social and educational roles of libraries can be felt more widely.

The transformation of digital library services in Bone Regency, South Sulawesi, represents an adaptive response to the challenges of the digital age and the diverse needs of the local community. The results of this study indicate that digitization efforts are not limited to the implementation of technology but also include the strengthening of social, cultural, and participatory dimensions in the governance of public information services. The following discussion outlines the main findings based on six themes while also examining theoretical and empirical implications

Digital Service Design and Innovation: Context-Based Inclusivity

The design of digital library services in Bone Regency was developed through an adaptive and innovative approach. Services such as an online portal, mobile application, OPAC, e-repository, and weblog were introduced as efforts to expand access to information for all segments of society. Interestingly, the development of these services is not static but based on a process of mapping user needs through surveys, discussions, and usage data analysis. These results reinforce the findings of Baryshev et al. (2020), which emphasize the importance of innovation and diversification of digital services as the key to the sustainability of libraries in the digital age, especially in non-urban areas.

However, what distinguishes the context of Bone Regency is the emphasis on adapting to local culture, where digitizing local knowledge collections and presenting visually appealing content are the main strategies for attracting the younger generation. This is in line with the Community-Based Design (CBD) approach, which emphasizes the importance of active community participation in designing services (Simonsen & Robertson, 2013).

The process of mapping needs and exploring user experiences implemented in Bone has led to the creation of more relevant and inclusive services. This practice also confirms the views of Case and Given (2016) regarding the need for regular information needs assessments to ensure that service development is truly based on the real needs of the community rather than merely following global technological trends.

Internationally, the digitization of library services based on local needs has also been identified as a best practice by Gill (2000), which recommends that every library system development take into account the sociocultural context, user demographics, and digital literacy trends in its community. The findings in Bone add evidence that innovations based on local

needs are far more effective in driving the adoption and benefits of digital services than simply replicating generic models from urban areas. Despite these advances, the persistence of contextual barriers shows that innovation in design must go hand in hand with systemic support such as funding, infrastructure, and policy alignment. Service design in Bone demonstrates inclusivity and cultural adaptation, but sustainability depends on broader institutional backing.

Utilization and User Experience: Towards Inclusive Digital Literacy

Digital library services in Bone Regency have been proven to improve access to information and strengthen digital literacy among the community, especially students and academics. Users utilize various digital services to search for book references, scientific journal articles, and final project publications and generally express satisfaction with the completeness and ease of access to digital collections. These findings support the results of a study by Abidin & Eriyadi (2024) and Meesad & Mingkhwan (2024), which found that digital libraries play a crucial role in supporting learning, research, and knowledge development in higher education.

Additionally, user experiences in Bone indicate that digital libraries have successfully become the primary reference source, especially for users requiring credible and up-to-date scientific references. This success aligns with the study by Kustanti and Ulfah (2017), which emphasizes the importance of integrating digital library platforms with reputable academic information sources.

Palmer's (2022) and Tinur's (2021) study also confirms that the diversity of digital content and ease of access are key factors in increasing user participation in the era of digital transformation. However, this study also found technical challenges that still need to be overcome, such as access disruptions due to system maintenance, limited internet infrastructure, and competition with other technology platforms that are more popular among the younger generation, such as social media.

These issues have been widely reported in the literature (Idrus & Pawerangi, 2023; King, 2020) and reflect that the success of library service digitization is highly dependent on the readiness of reliable infrastructure and support systems. Additionally, these findings add a new dimension: relevance and ease of access alone are insufficient; sustained efforts are needed to ensure services remain competitive and appealing to users, such as through enhanced promotion, gamification, or integration with digital platforms already familiar to the public. The persistence of these problems suggests that user experience is shaped not only by service design but also by systemic readiness, which remains uneven. Digital services are valued by users, but without stronger infrastructure and continuous adaptation, inclusivity will remain limited.

Challenges and Constraints in Implementation: Dynamics of Limitations and Adaptation

Although the achievements of digital services in Bone Regency are quite encouraging, this study highlights a number of implementation challenges that still hinder the optimal utilization of digital libraries.

The main obstacles include low digital literacy among some users, limited human resources in the field of digital promotion, and uneven technological infrastructure. These findings are consistent with the study by Hazan & Ayub (2024) and Sudradjat (2019), which states that the digitization of library services in rural Indonesia tends to be hampered by weak human resource support, budget, and technological infrastructure.

In the context of the Diffusion of Innovations theory (Dearing & Cox, 2018), low digital literacy and a lack of IT professionals can slow down the adoption of innovations and even cause

user resistance to new services. Delliana's (2025) and Ramadhan's (2023) study shows that digital promotion efforts that are not institutionally structured risk narrowing the reach of promotion and reducing adoption rates. This study proves that promotional strategies in Bone still heavily rely on individual initiatives by librarians or informal communication on social media. However, as highlighted by Bawden & Robinson (2022), library institutions need to adopt integrated and systematic digital marketing strategies to reach a broader community effectively.

On the other hand, infrastructure limitations such as unstable internet connections, limited hardware, and digital collections perceived as monotonous indicate an urgent need for technological investment and the development of more varied content. These findings reinforce the results of Winoto & Sukaesih (2021) and Ridha & Kusasi (2024), who emphasized that the development of digital collections and supporting technology is a vital aspect of the sustainability of digital libraries in rural areas. Thus, the challenges in implementing digital services in Bone Regency can be understood as a reflection of the classic digital divide problem, namely the gap in access, skills, and resources between urban and rural communities (Onunka et al., 2023). Despite ongoing innovation and evaluation, structural constraints explain why these problems persist. Service improvement has outpaced the institutional and infrastructural capacity required for sustainable implementation. Challenges reflect structural limitations that demand systemic solutions, not just technological fixes.

Adaptation, Evaluation, and Improvement of Services: Sustainable and Responsive Practices

One of the key strengths of digital library services in Bone Regency lies in the regular and structured practices of service evaluation and adaptation. Evaluations are conducted monthly or semi-annually, using data on visits, user feedback, and trend analysis of needs. The results of these evaluations serve as the basis for service improvements, enriching the digital collection and adjusting service features to make them more user-friendly.

This is in line with the principles of user-centered design in information system development, where feedback and evaluation cycles are the main mechanisms for improving service quality (Case & Given, 2016). User involvement in the evaluation process is also evident from online surveys, comment columns on the website and active participation in workshops or digital training.

A study by Heriyati et al. (2021) and Herianti et al. (2023) highlights the importance of continuous evaluation practices to ensure that library services remain relevant and attractive to the community. This study reinforces empirical evidence that good evaluation mechanisms can result in service innovations, increased user satisfaction, and strengthened library competitiveness in the digital era.

At the international level, the experience of the Bone Library is in line with Das's (2021) study to develop user feedback-based public information systems so that institutions can continue to adapt to changing needs, technologies, and digital literacy trends. Thus, the culture of evaluation and adaptation that has grown in Bone demonstrates the institution's readiness to manage change responsively and sustainably. Nevertheless, evaluations tend to privilege the voices of active users, leaving more vulnerable groups underrepresented. This weakens the inclusivity of improvement efforts. Continuous evaluation is a strength, but to achieve equity, evaluation must deliberately incorporate marginalized voices.

User Participation and Community Involvement: The Foundation of Participatory-Based Transformation

One important finding in this study is the emergence of active participation by users and communities in the development of digital library services. Although this involvement is not yet optimal, various initiatives such as workshops, seminars, online surveys, and digital literacy training have created an effective space for dialogue between libraries and the community.

Two-way communication forums, such as suggestion boxes and social media channels, are also utilized to accommodate aspirations, criticisms, and suggestions from users. These findings confirm the results of studies by Heriyati et al. (2021) and Veronika (2023), which indicate that user participation is an important factor in supporting community-based library service transformation.

Within the framework of participatory design, the presence of participatory spaces enables libraries to gain a deeper understanding of the needs, expectations, and social dynamics of their communities (Simonsen & Robertson, 2013). DiSalvo et al. (2012) even emphasize that active user participation can build a sense of ownership and loyalty toward digital services, thereby impacting the sustainability of innovation adoption. However, the challenge remains in expanding and optimizing participatory spaces to engage broader segments of society, including marginalized groups and those who are digitally illiterate. To this end, libraries need to enhance promotional efforts, develop more inclusive communication channels, and provide ongoing digital literacy training. Persistent inequalities in participation suggest that without targeted outreach, participatory design may reinforce rather than reduce exclusion. Participation is growing but must evolve toward deeper inclusivity to achieve its transformative promise.

Social Impact, Relevance, and Expectations: Towards an Empowering Digital Library

The impact of digital library services in Bone Regency is evident in the improvement of digital literacy, expansion of access to information, preservation of local knowledge, and strengthening of community social networks. Users and stakeholders believe that these services are not only a means of learning and research but also significantly contribute to empowering local communities, particularly the younger generation, to understand their local culture and knowledge better. These findings align with the research by Bawden & Robinson (2022) and Rahmanova (2025), which emphasizes that adaptive digital libraries can serve as a bridge between the preservation of local knowledge and the enhancement of community literacy capacity.

These findings also reinforce the recommendations of Gill (2000), which encourages libraries in the digital age to expand their role as community hubs centers of community-based interaction, learning, and cultural preservation. By developing inclusive and responsive digital services, Bone Library has taken a significant step toward becoming an institution that is not only functionally relevant but also socially and culturally meaningful amid the dynamics of change.

Looking ahead, as expressed by the informants, the hope is that digital library services will further strengthen inclusivity, innovation, and sustainability and truly be oriented toward the real needs of users and the community. This requires multi-stakeholder collaboration, capacity building, technological investment, and the courage to continue innovating and adapting to the evolving times. The persistence of uneven access shows that the social impact of

digital libraries, while significant, is not yet equally distributed across all groups. Social impacts are visible, but long-term empowerment depends on tackling access inequalities and sustaining cross-sectoral collaboration.

Theoretical and Practical Implications

Theoretically, this study enriches the literature on community-based digital libraries in rural areas by emphasizing the importance of integrating participatory approaches (CBD) and information needs assessment in every stage of service development. This study also provides empirical evidence that the success of digital library services is highly dependent on institutional sensitivity to local needs, infrastructure readiness, and willingness to adapt continuously.

Practically, the results of this study provide several important recommendations, including (1) the need to develop an integrated and systematic digital promotion strategy, (2) improving human resource capacity through IT and digital literacy training, (3) developing a more varied and locally-based digital collection, and (4) optimizing user and community participation in every decision-making process related to digital services.

CONCLUSION

This study confirms that the transformation of digital library services in Bone Regency has brought significant changes in the provision and utilization of public information at the local community level. Innovative and adaptive service design, strengthened user participation, and the integration of local wisdom-based content have promoted digital literacy, expanded access to information, and reinforced the social relevance of libraries in the digital age. The practice of mapping user needs and conducting continuous evaluation demonstrates the effectiveness of participatory approaches in developing community-based digital library services.

Beyond these findings, several actionable steps can be considered. For library practitioners, introducing structured digital literacy programs for example, training modules tailored for students, farmers, and MSME actors can help bridge the skill gap. Developing systematic and institutionalized promotion strategies, such as regular online campaigns and partnerships with schools and community organizations, will ensure wider awareness and adoption. For policymakers, investments in stable internet infrastructure, librarian capacity building in IT and digital management, and cross-sector collaborations are essential to sustain service innovations.

SUGGESTION

This study was limited to one location and a relatively small group of informants, which may restrict the generalizability of findings. The reliance on qualitative methods also means that interpretations are context-specific and may reflect certain biases despite triangulation. These limitations may have influenced the depth of perspectives captured, particularly from marginalized groups. Future research should expand to multiple regions, employ mixed methods, and include larger and more diverse samples to capture broader patterns of digital library use. Longitudinal studies would also provide insights into how digital library adoption evolves over time.

Despite its limitations, this study highlights that the sustainability of digital libraries in rural contexts depends not only on technological innovation but also on participatory governance, policy support, and inclusive practices. By combining community-based

approaches with concrete institutional strategies, digital libraries can become powerful instruments for strengthening literacy, preserving culture, and empowering communities

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