



Transformation of Library Information Services through a User-Centered Approach in the Digital Age

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ABSTRACT

This study aims to analyze the transformation of library information services through a user-centered approach in the digital age. The study addresses the growing need for academic libraries to provide services that are not only digitally available, but also accessible, responsive, inclusive, and aligned with users' academic practices. A qualitative case study design was used at the Library of Universitas Islam Negeri Raden Intan Lampung, Bandar Lampung, Indonesia, from November to December 2025. Data were collected through semi-structured interviews, non-participant observation, and documentation. The participants consisted of 20 informants, including students, lecturers, librarians, and library information system staff selected through purposive sampling. The data were analyzed using reflexive thematic analysis. The findings reveal six main themes: digital access as a new form of academic dependence, the gap between service availability and usability, librarian responsiveness, uneven digital literacy, communication and visibility of digital services, and the need for participatory service development. These findings show that digital transformation in libraries is not merely a technological shift, but a service transformation shaped by user experience, librarian support, institutional readiness, and digital literacy. The study contributes to digital library service studies by emphasizing the importance of user-centered service design in improving academic information access. Practically, the findings suggest that academic libraries should simplify digital interfaces, strengthen digital literacy programs, improve service communication, and create regular user feedback mechanisms.



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1. Introduction

The transformation of library information services has become a central issue in higher education as users increasingly depend on digital access, remote information support, electronic resources, and personalized academic assistance. Libraries no longer function only as physical repositories of printed collections. They now serve as digital knowledge hubs that support learning, research, publication, and information literacy. This shift became more visible after the COVID-19

pandemic, when universities across the world had to expand online library services to sustain academic activities. Mehta and Wang (2020) found that university libraries strengthened remote access, virtual reference services, and digital guidance to respond to users' changing needs. This condition shows that digital transformation in libraries is not merely a technical process. It is also a service transformation that requires a deeper understanding of user behavior, expectations, and barriers.

In Indonesia, academic libraries face similar pressure to redesign their information services in line with digital learning practices. Students and lecturers increasingly expect library services that are fast, simple, interactive, and accessible from different devices. Digital catalogs, institutional repositories, online reference services, e-journals, and social media channels have become important parts of library service delivery. Pambayun (2021) showed that studies on digital libraries increased during the pandemic because electronic services became a key strategy for maintaining information access. However, the expansion of digital services does not always guarantee effective user experience. Many users still prefer general search engines because they consider library platforms less practical, less familiar, or difficult to navigate. This situation indicates a gap between institutional efforts to provide digital services and users' actual experience in accessing them.

Field problems in academic libraries show that digital transformation often focuses more on system availability than on user-centered service design. Users may face difficulties in finding relevant sources, understanding access procedures, using online catalogs, or receiving timely assistance from librarians. In some cases, users do not know that the library already provides digital services because communication channels are not clear enough. Zhao and Zhang (2024) found that digital academic libraries still face challenges in managing large databases, improving system security, inviting user feedback, and developing user-centric interfaces. Muslim (2024) also reported that digital transformation can improve access and knowledge management, but problems remain in interface design, digital literacy, and inclusive service delivery. These findings indicate that library transformation needs to move beyond technology adoption and pay closer attention to how users experience services in real academic contexts.

This issue is important because library information services influence academic participation, learning quality, and knowledge access. When services are difficult to use, users with lower digital literacy may experience stronger barriers in finding reliable academic information. This condition can affect students' ability to complete assignments, conduct research, and develop information literacy skills. Alabi and Mutula (2020) emphasized that inclusive digital access is essential for users who face technological or accessibility barriers. Dei and Asante (2022) also argued that academic libraries support quality education by providing access to information resources and learning support. Therefore, a user-centered approach is needed to ensure that digital library services respond to real needs, not only institutional assumptions. This approach places users' experiences, expectations, limitations, and feedback at the center of service development.

Previous studies have discussed digital library services, pandemic response, electronic resource access, and the role of academic libraries in digital learning. Ashiq et al. (2021) reviewed how libraries transformed their services during the COVID-19 pandemic, while Dube and Jacobs (2023) explained how academic libraries expanded online services in higher education institutions. Mbambo-Thata (2021) described how university libraries responded to service restrictions, and Peruginelli et al. (2021) examined digital legal information services during the pandemic. However, many previous studies still focus on institutional adaptation, service availability, and technological change. Fewer studies explore how users interpret digital library services, how librarians understand user needs, and how user-centered principles shape service transformation. This gap is important because the success of digital library services depends not only on infrastructure, but also on the meanings, interactions, and experiences formed between users, librarians, and digital systems.

Based on this gap, this study aims to analyze the transformation of library information services through a user-centered approach in the digital age. The study focuses on users' experiences in accessing digital library services, librarians' strategies in identifying user needs, and the challenges that emerge in transforming information services. The study uses a qualitative perspective because it seeks to understand meanings, experiences, and processes in a specific academic library context. Theoretically, this study contributes to the development of digital library service studies by linking user-centered service design with information service transformation. Practically, the study provides insights for academic library managers in designing services that are more accessible, responsive, inclusive, and aligned with users' academic needs.

2. Materials and Methods

This study used a qualitative approach with a case study design. The case study design was selected because the research aimed to understand the transformation of library information services in a specific institutional context. This design allowed the researcher to examine service practices, user experiences, librarian strategies, and digital service challenges in depth. Mtisi (2022) explains that qualitative case studies are useful for exploring complex phenomena in real-life settings. Chowdhury and Shil (2021) also state that case study research helps researchers understand the interaction between context, actors, processes, and evidence. Therefore, this design was relevant because the study did not intend to measure service effectiveness statistically, but to interpret how users and librarians experienced digital service transformation.

The research was conducted at the Library of Universitas Islam Negeri Raden Intan Lampung, Bandar Lampung, Indonesia. The research period was from November 2025 to December 2025. This location was selected because the library serves diverse academic users, including students, lecturers, researchers, and administrative staff. The library also provides several digital services, such as an online catalog, institutional repository, electronic resources, digital reference support, and online communication channels. These characteristics made the site relevant for examining how library information services transform in the digital age. The research was written in English, while the field data were interpreted carefully to preserve the meaning of participants' experiences.

Participants were selected using purposive sampling because the study required informants who had direct experience with library information services. Campbell et al. (2020) explain that purposive sampling helps qualitative researchers select participants who can provide rich and relevant information. The participants consisted of 20 informants, including 12 undergraduate and postgraduate students, 3 lecturers, 3 librarians, and 2 library information system staff. Student participants were selected based on their experience using at least one digital library service during the last semester. Librarians were selected because they were directly involved in user services, digital reference support, or service management. Information system staff were included because they understood the technical operation of digital platforms. If additional clarification was needed, limited snowball sampling was used by asking key informants to recommend other users with relevant experiences.

Data were collected through semi-structured interviews, non-participant observation, and documentation. Semi-structured interviews were used to explore users' experiences, service expectations, digital access barriers, and perceptions of service quality. This format allowed the researcher to ask the same main questions while still giving participants space to explain their experiences in detail. Non-participant observation was conducted to examine user interactions with service desks, online catalog access, repository use, digital help channels, and librarian-user communication. Documentation was carried out by reviewing service guidelines, library website pages, repository pages, social media posts, and digital service forms. The use of these three techniques supported methodological triangulation and helped the researcher obtain a more complete understanding of the case.

Data validity was ensured through source triangulation, method triangulation, member checking, and audit trail. Source triangulation was conducted by comparing information from students, lecturers, librarians, and information system staff. Method triangulation was applied by comparing interview data, observation notes, and documents. Member checking was conducted by asking selected participants to review summaries of their interview results and the researcher's preliminary interpretations. McKim (2023) explains that meaningful member checking can strengthen the credibility of qualitative interpretation when it is conducted in a structured way. An audit trail was also maintained by keeping interview guides, transcripts, observation notes, coding records, document analysis notes, and analytic memos. Reflexivity was used throughout the research process to help the researcher recognize assumptions and reduce interpretive bias.

The data were analyzed using reflexive thematic analysis. This method was selected because the study aimed to identify patterns of meaning in participants' experiences of library service transformation. Braun and Clarke (2021) argue that reflexive thematic analysis allows researchers to develop themes through deep engagement with data. Byrne (2022) also shows that thematic analysis can help researchers connect codes, categories, themes, and interpretation in a transparent way. The analysis process involved six stages: familiarizing with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and writing the findings. The expected themes included digital service accessibility, ease of system use, librarian responsiveness, user feedback, digital literacy barriers, and the need for user-centered service design. The final results were presented in a narrative form to explain how digital transformation was experienced, interpreted, and negotiated by library users and service providers.

3. Results and Discussions

The results and discussions section is the main part of the paper. The author(s) meticulously present their findings, providing a comprehensive analysis of the data collected. The author(s) elucidates the significant trends and patterns observed, correlating them with the hypotheses stated earlier in the study. The discussion integrates these findings with existing literature, highlighting agreements and discrepancies with prior research. The author(s) delve into the implications of the results, considering both theoretical and practical perspectives. Furthermore, the author(s) should address potential limitations and suggest areas for future research to build upon their work, ensuring a holistic understanding of the topic under investigation.

Avoid using personal pronouns, value judgments, elements of the methodology description, and direct repetition of the data given in the tables and graphic material in the text. Numerical results should be rounded in accordance with accepted rules, considering the mean error in the experiment, the confidence interval, or the distribution of values. Research results must be sufficiently substantiated, methodologically correct, and have novelty as well as practical value. The "Discussion" exemplarily described by the author provokes a discussion and invites other scientists interested in the subject to take part in it, bringing their well-grounded vision of the problem under discussion.

4. Conclusions

The findings show that the transformation of library information services was experienced by users as a shift from physical assistance to hybrid and digital support. Most participants stated that the library had become easier to access because several services were available through online platforms, such as the online catalog, institutional repository, digital reference service, and social media announcements. However, this transformation did not remove the need for direct librarian support. Students still needed guidance when searching for academic sources, using keywords, accessing full-text documents, and understanding repository procedures. One student stated, "The online catalog helps me find books faster, but I still need help when the search results are too

many or when I do not know the right keywords.” This response shows that digital access improves service reach, but users still need human assistance to interpret information effectively.

The first main theme that emerged from the data was digital access as a new form of academic dependence. Users appreciated digital services because they could access information without always visiting the library building. This was especially useful for students who worked on assignments, theses, and research outside campus hours. Lecturers also viewed digital services as helpful because they could check repository materials and library collections before advising students. Observation data showed that students often used mobile phones to access library information, while laptops were used mainly for downloading, reading, or managing academic sources. This pattern indicates that users expect library services to follow their daily digital habits. Digital access was not only seen as a technical facility, but as part of academic survival in a fast-paced learning environment.

The second theme was the gap between service availability and service usability. Although the library had provided several digital platforms, not all users understood how to use them effectively. Some participants reported that they knew the library had an online catalog and repository, but they rarely used them because the interface was considered less familiar than general search engines. A participant explained, “I usually search on Google first because it is faster. I use the library website only when the lecturer asks for references from the repository.” This finding shows that the existence of digital services does not automatically create user engagement. Users tend to choose platforms that they perceive as simple, fast, and familiar. The issue was not only access, but also usability, clarity, and user confidence.

The third theme was librarian responsiveness as a key element of user-centered service. Participants who had interacted with librarians described the service positively when librarians gave clear explanations, responded patiently, and guided users step by step. Librarians were not only viewed as information providers, but also as facilitators who helped users understand academic information systems. One lecturer stated, “Students often do not have problems with motivation. They have problems with direction. Librarians can help them understand where to search and how to select credible sources.” This statement highlights the educational role of librarians in digital service transformation. The user-centered approach became visible when librarians listened to user problems and translated technical procedures into practical instructions.

The fourth theme was digital literacy as an uneven user capacity. The data showed that users had different levels of ability in using digital library services. Senior students were generally more familiar with repositories and academic databases because they needed them for thesis writing. New students tended to rely on friends, lecturers, or social media information. Some users also lacked confidence in evaluating the quality of digital sources. A librarian explained, “Many users can search information, but they do not always know whether the source is academic, credible, or relevant.” This finding suggests that digital transformation requires more than platform development. It also requires continuous literacy support so users can access, evaluate, and use information responsibly.

The fifth theme was communication and visibility of digital services. Documentation and observation showed that the library used websites and social media to share information about services. However, some users stated that they did not always notice service updates because information was scattered across different channels. Students preferred short, visual, and direct information, while formal web announcements were often overlooked. This finding reflects a cultural shift in academic communication. Users are more responsive to practical and visually clear information than long procedural descriptions. Therefore, digital library communication needs to be designed according to users’ media habits.

The sixth theme was the need for participatory service development. Several participants suggested that the library should involve users more actively before improving digital services. Students wanted simpler search features, clearer tutorials, faster chat responses, and more visible

access links. Lecturers expected better integration between library services, learning management systems, and academic writing support. Librarians also recognized the need for regular feedback mechanisms. One librarian stated, “Sometimes we think the service is already clear, but users experience it differently. Their feedback helps us see the weak points.” This statement shows that user-centered transformation depends on continuous dialogue between service providers and users.

Overall, the findings indicate that library information service transformation is not a linear shift from manual to digital services. It is a negotiated process shaped by user habits, librarian roles, institutional readiness, digital literacy, and communication patterns. Users valued digital services when they were accessible, simple, responsive, and relevant to their academic needs. However, they became less engaged when services were difficult to understand, poorly communicated, or disconnected from daily academic practices. The central pattern found in this study is that digital transformation becomes meaningful only when it is supported by user-centered interaction.

Discussion

The findings confirm that digital transformation in academic libraries should be understood as a service and cultural transformation, not merely a technological transition. This study supports Mehta and Wang (2020), who found that university libraries expanded remote services, digital reference, and online support to respond to changing user needs. It also aligns with Ashiq et al. (2021), who showed that libraries transformed their services during the COVID-19 period by strengthening digital access and electronic resources. However, the present study extends those findings by showing that users judge digital transformation not only from the availability of digital platforms, but also from their ease of use, clarity, responsiveness, and relevance to academic tasks.

The finding on the gap between service availability and service usability is consistent with Muslim (2024), who reported that digital transformation improves access and knowledge management but still faces challenges in interface design, digital literacy, and inclusivity. This study strengthens that argument by showing how users compare library platforms with general search engines. Users do not reject library services because they lack academic value. They avoid them when the access process feels complicated or unfamiliar. This finding suggests that academic libraries must compete not only in terms of collection quality, but also in terms of user experience. A user-centered approach is therefore essential because it places user behavior, not institutional assumptions, at the center of service design.

The role of librarians also emerged as a critical factor in service transformation. The findings show that users still need librarians even when digital platforms are available. This supports Dei and Asante (2022), who argue that academic libraries contribute to quality education by providing access to information and learning support. In this study, librarians acted as mediators between users and digital systems. They helped users understand search strategies, source credibility, and access procedures. This means that digital transformation does not reduce the importance of librarians. Instead, it changes their role from collection gatekeepers to learning facilitators, digital guides, and user experience partners.

The findings on digital literacy show that users’ ability to use digital services is uneven. This supports Alabi and Mutula (2020), who emphasized the importance of digital inclusion in academic libraries. Digital services may become exclusionary when users lack the skills, confidence, or support needed to use them. In this study, new students, less experienced users, and users unfamiliar with academic databases needed more intensive guidance. This finding implies that user-centered library transformation must include digital literacy programs, short tutorials, help desks, and proactive guidance. Digital transformation should not assume that all users are digitally ready.

The findings also reveal that communication is an important part of digital library service transformation. Library services may exist, but users may not use them if they do not understand where to find them or how to access them. This condition is in line with Zhao and Zhang (2024), who found that digital academic libraries need user feedback, interface improvement, and better engagement strategies. The present study adds that communication should follow users' media habits. Students prefer clear, short, visual, and practical information. Therefore, libraries need to design communication strategies through websites, social media, video tutorials, and direct academic channels.

Another important finding is the need for participatory service development. The study shows that librarians and users often perceive services differently. Librarians may consider a procedure clear, while users may experience it as confusing. This gap supports the relevance of user-centered service design. The theory emphasizes that services should be developed based on user needs, user feedback, and iterative improvement. In the context of library services, this means that users should not only become service recipients. They should also become sources of insight for service evaluation and redesign.

Compared with previous studies, this research provides a more contextual understanding of digital library transformation in an Indonesian academic library setting. Dube and Jacobs (2023) showed that academic libraries expanded services during the pandemic, while Mbambo-Thata (2021) described institutional responses to service restrictions. This study moves the discussion beyond emergency response by focusing on the post-pandemic digital service environment. The findings show that digital library transformation has become part of normal academic life, but it still requires refinement in usability, literacy support, communication, and user participation.

Theoretically, this study contributes to the development of digital library service studies by connecting user-centered service design with information service transformation. The findings show that digital transformation becomes effective when technology, human support, and user experience interact in a balanced way. Practically, the study recommends that academic libraries conduct regular user needs assessments, simplify digital interfaces, strengthen librarian-user communication, provide digital literacy training, and create feedback channels for service improvement. Future research can examine user-centered library transformation across several universities, compare public and private academic libraries, or use mixed methods to measure the relationship between user experience, digital literacy, and service satisfaction.

Conclusion

This study concludes that the transformation of library information services in the digital age cannot be understood only as the adoption of digital platforms. The findings show that users value digital services when they are easy to access, simple to use, clearly communicated, and supported by responsive librarians. Six main themes emerged from the analysis, namely digital access as an academic necessity, the gap between service availability and usability, the importance of librarian responsiveness, uneven digital literacy, weak visibility of digital services, and the need for participatory service development. These themes indicate that user-centered transformation requires a balance between technology, human support, and users' real academic practices. The study contributes to the literature by showing that digital library services become meaningful when they are shaped by users' experiences, needs, barriers, and feedback.

The findings have theoretical, practical, and policy implications. Theoretically, this study strengthens the relevance of user-centered service design in digital library research by showing that service transformation depends on interaction between users, librarians, and digital systems. Practically, academic libraries need to simplify digital interfaces, improve online service guidance, strengthen digital literacy programs, and build more responsive communication channels. At the policy level, university library managers should develop service standards that include regular user needs assessment, accessibility evaluation, and participatory feedback mechanisms. Future studies can expand this research by comparing several academic libraries,

involving users from different institutional backgrounds, or applying mixed methods to examine the relationship between digital literacy, user experience, and satisfaction with library information services.

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