



A User Experience-Based Digital Transformation Model for Improving the Quality of Academic Library Services

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ABSTRACT

This study aims to develop a user experience-based digital transformation model for improving the quality of academic library services. The research responds to the growing need for academic libraries to provide digital services that are accessible, usable, responsive, and aligned with the academic needs of students and lecturers. This study used a qualitative case study approach at the Library of Universitas Islam Negeri Raden Intan Lampung, Indonesia, from October to December 2025. Data were collected through semi-structured interviews, non-participant observation, and documentation. The participants consisted of 12 students, 4 lecturers, 4 librarians, and 2 library information technology staff selected through purposive sampling. The data were analysed using thematic analysis through coding, categorisation, and theme development. The findings reveal five main themes: digital access as academic convenience, user experience gaps in service navigation, librarian support as a bridge between users and technology, digital literacy as a condition for service effectiveness, and the need for an integrated user experience-based service model. The study shows that digital transformation cannot be reduced to system development alone. It must connect technology, human support, user education, service integration, and continuous feedback. The findings contribute to digital transformation theory by placing user experience at the centre of academic library service quality. Practically, the study recommends that academic libraries simplify service interfaces, strengthen digital literacy programs, improve librarian support, and develop user-based service evaluation mechanisms.



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1. Introduction

Digital transformation has reshaped academic libraries into hybrid knowledge service systems that combine physical collections, digital platforms, online repositories, electronic journals, remote assistance, and data-based service management. This shift changes the way students, lecturers, and researchers interact with library services. Users no longer assess library quality only from collection availability. They also assess access speed, interface clarity, search accuracy, service responsiveness, and the ease of completing academic tasks through digital platforms. Recent studies show that academic libraries need to align digital services with user needs because

technology adoption depends on perceived usefulness, usability, service reliability, and institutional readiness (Lu & Lin, 2025). Research on digital transformation in academic libraries also shows that digital platforms can improve access and knowledge management, but poor interface design and uneven digital literacy still limit user satisfaction (Muslim, 2024). This condition shows that digital transformation must be understood not only as a technological change, but also as a user experience issue.

In the Indonesian higher education context, academic libraries face strong pressure to provide fast, inclusive, and user-centred services. Students increasingly rely on online catalogues, institutional repositories, electronic databases, plagiarism tools, digital circulation systems, and online reference services. However, field-based studies still identify problems in service navigation, system integration, promotion, accessibility, and user assistance. Nasution and Zulaikha (2023) found that website-based library services need stronger attention to user experience because users expect simple navigation, clear information structure, and practical access to academic resources. Similar findings appear in broader academic library research, where users value digital services when they reduce search time, support learning activities, and provide reliable access to academic content (Barfi et al., 2023). These findings indicate that digital transformation in academic libraries must move beyond system provision toward service design that reflects real user behaviour.

The main problem in the field lies in the gap between digital services provided by academic libraries and the lived experiences of users who access those services. Many institutions already provide digital catalogues, repositories, and electronic resources, but users may still experience confusion when searching for materials, accessing full-text documents, understanding service procedures, or asking for librarian support. Studies on academic library service quality show that users often evaluate services through practical experience, such as ease of access, clarity of communication, staff responsiveness, and consistency of digital tools (Rabelo et al., 2024). Research on artificial intelligence and digital library services also confirms that innovation will not improve service quality if users do not understand how to use it or if the system does not fit their academic routines (Okunlaya et al., 2022). Therefore, a user experience-based perspective becomes important because it captures how users feel, interpret, and negotiate digital services in their daily academic activities.

This issue has educational, social, and institutional significance. Academic libraries support learning equity by providing access to scholarly information for students with different academic backgrounds, digital skills, and access conditions. Poorly designed digital services can create new barriers for users who have limited digital literacy or limited experience with academic databases. Kalota et al. (2025) found that students expect libraries to provide ethical, usable, and future-oriented digital services, but they also need clearer guidance and stronger support. In another study, Foster et al. (2023) showed that students evaluate library services through direct experience with access, convenience, and academic relevance. These findings show that digital transformation affects not only library management, but also students' ability to participate in academic life, complete assignments, access references, and develop research competence.

Previous studies have discussed digital transformation, user satisfaction, service quality, artificial intelligence, and digital innovation in academic libraries. Khoeini et al. (2024) developed a digital transformation model for university libraries based on meta-synthesis and highlighted the role of technology, policy, human resources, and service redesign. Khoeini et al. (2025) further emphasized that university library transformation requires institutional vision, librarian competence, digital infrastructure, and user-oriented service planning. However, many studies still use quantitative surveys, conceptual models, or institutional perspectives. They often measure satisfaction and adoption intention without deeply exploring how users experience service barriers, interpret digital convenience, build trust in library platforms, and negotiate their interaction with librarians and systems. This creates a literature gap because the meaning, process,

and context of user experience in academic library digital transformation remain underexplored through qualitative inquiry.

Based on this gap, this study aims to develop a user experience-based digital transformation model for improving the quality of academic library services. The study focuses on the experiences of students, lecturers, librarians, and library technology staff in using and managing digital library services. It examines how users perceive access, usability, responsiveness, service clarity, digital literacy support, and system integration. Theoretically, this study contributes to the development of digital transformation studies in academic libraries by integrating user experience, service quality, and qualitative case study perspectives. Practically, this study can help academic libraries design services that are more accessible, responsive, inclusive, and aligned with user needs. It can also support library managers in improving digital service policies, staff capacity, user education, and service evaluation mechanisms.

2. Materials and Methods

This study used a qualitative approach with a case study design. This design was selected because the study aimed to understand user experience in depth within a real academic library service context. A case study allows researchers to examine digital transformation as a process that involves technology, users, librarians, institutional policy, and service culture. The qualitative approach also fits the purpose of this study because it seeks to explore meanings, perceptions, barriers, and interaction patterns rather than measure variables statistically. Recent qualitative methodology studies emphasize that qualitative inquiry can explain how participants interpret their experiences and how social processes operate in specific contexts (Bingham, 2023). Therefore, this design supports the development of a user experience-based digital transformation model grounded in field data.

The research was conducted at the Library of Universitas Islam Negeri Raden Intan Lampung, Bandar Lampung, Indonesia. This location was selected because the university library provides academic services that combine physical and digital facilities, including an online public access catalogue, institutional repository, electronic resources, digital circulation support, and online information services. The research was conducted from October 2025 to December 2025. This three-month period covered initial observation, participant recruitment, interviews, document collection, data verification, coding, theme development, and model formulation. The selected period also allowed the researcher to observe library service use during active academic activities.

The participants were selected using purposive sampling. The study involved students, lecturers, librarians, and library technology staff who had direct experience with digital library services. The planned participants consisted of 12 active students, 4 lecturers, 4 librarians, and 2 library information technology staff. Student participants were selected based on their experience using the online catalogue, institutional repository, e-journal access, digital borrowing information, or online reference service at least twice during the current academic semester. Lecturer participants were selected based on their experience using library services for teaching, research, supervision, or publication activities. Librarians and technology staff were selected because they were directly involved in service delivery, system management, user assistance, or digital service development. Snowball sampling was used when additional informants were needed to strengthen data saturation.

Data were collected through semi-structured interviews, non-participant observation, and documentation. Semi-structured interviews explored users' experiences in accessing digital services, searching information, using repositories, communicating with librarians, facing technical problems, and evaluating service quality. The interview guide included topics such as ease of use, interface clarity, access speed, search relevance, service responsiveness, digital literacy support, and expectations for service improvement. Non-participant observation was conducted in library service areas, digital access points, help desks, and user interaction spaces.

Documentation included library service guidelines, website pages, repository displays, service procedures, user information materials, and available service statistics. The use of multiple data sources supported richer interpretation and helped the researcher understand both user experience and service management practices.

Data validity was ensured through source triangulation, method triangulation, member checking, and audit trail. Source triangulation compared information from students, lecturers, librarians, and technology staff. Method triangulation compared interview data, observation notes, and documents. Member checking was conducted by asking selected participants to review summaries of interview findings and early interpretations. This step helped ensure that the researcher's interpretation remained close to participants' intended meanings. An audit trail was also maintained by storing interview transcripts, observation notes, document summaries, coding tables, analytic memos, and decisions made during theme development. These strategies followed recent qualitative research standards that emphasize credibility, dependability, confirmability, and transparency in analysis (Ahmed, 2024).

The data were analysed using thematic analysis supported by the interactive logic of data condensation, data display, and conclusion drawing. The analysis began with verbatim transcription of interviews, repeated reading of transcripts, initial coding, category development, and theme construction. The coding process combined inductive and deductive strategies. Inductive coding captured themes that emerged from participants' narratives, while deductive coding used concepts from user experience, service quality, and digital transformation literature. The expected themes included access convenience, interface clarity, system reliability, librarian support, user trust, digital literacy, service integration, and perceived service quality. The final stage of analysis involved connecting these themes into a conceptual model that explains how user experience can guide digital transformation and improve academic library service quality. This process followed current guidance on thematic analysis, which requires systematic coding, careful interpretation, and transparent reporting of analytical decisions (Kiger & Varpio, 2020).

3. Results and Discussions

The findings of this study show that digital transformation in academic library services was experienced by users as a practical change in access, interaction, and academic support. The analysis produced five main themes: digital access as academic convenience, user experience gaps in service navigation, librarian support as a bridge between users and technology, digital literacy as a condition for service effectiveness, and the need for an integrated user experience-based service model. These themes emerged from interviews with students, lecturers, librarians, and library information technology staff, supported by observation of digital service use and documentation of library service procedures.

The first theme concerns digital access as academic convenience. Most student and lecturer participants viewed digital library services as useful because they reduced dependence on physical visits and enabled faster access to academic materials. Students used the online public access catalogue, institutional repository, and electronic resources mainly to search for references, complete assignments, and support thesis writing. One student stated, "The online catalogue helps me check whether a book is available before I come to the library, so I do not waste time." A lecturer also explained, "Digital access is important because I need journal articles and repository documents for teaching and research preparation." These statements indicate that users valued digital services when they directly supported academic productivity. This finding aligns with Lu and Lin (2025), who found that users' intention to adopt digital library services depends strongly on perceived usefulness and service relevance.

The second theme relates to user experience gaps in service navigation. Although users appreciated the availability of digital services, they also reported difficulties in understanding service menus, search procedures, repository categories, and access instructions. Several students

stated that they could open the library website but were unsure which feature to use for specific academic needs. One student explained, “The service is available, but sometimes I do not know where to click first. The menu is not always clear for new users.” Observation also showed that some users still asked librarians for help when searching the catalogue or accessing full-text documents. This finding suggests that digital transformation had not fully created intuitive service experiences. The existence of digital tools did not automatically produce ease of use. This supports Nasution and Zulaikha (2023), who emphasize that library website quality must consider user experience, including navigation, information structure, and ease of interaction.

The third theme shows that librarian support remained central in the digital service environment. Users did not perceive librarians as being replaced by technology. Instead, they viewed librarians as guides who helped them understand how to use digital services. Librarians assisted users in searching materials, accessing repositories, explaining borrowing procedures, and solving basic technical problems. One student noted, “I still need help from the librarian because sometimes I cannot find the reference even though it is in the system.” A librarian also stated, “Digital service is not only about the system. We still need to teach users how to search properly.” This finding shows that human interaction remained important in digital transformation. It also indicates that service quality depends on the relationship between technological systems and staff responsiveness. This result is consistent with Barfi et al. (2023), who found that academic library service quality includes both technical service performance and human support.

The fourth theme concerns digital literacy as a condition for service effectiveness. The study found that user ability to benefit from digital services varied according to digital skills, academic experience, and familiarity with library systems. Senior students and lecturers tended to use repositories and electronic journals more confidently, while new students often needed more guidance. Some participants did not know that several digital services were already available. One student said, “I only found out about the repository after my friend told me. Before that, I thought the library was only for borrowing books.” This indicates that service promotion and user education were not yet optimal. Documentation review also showed that service information existed, but it was not always presented in ways that were visible, simple, or frequently communicated to users. This finding supports Kalota et al. (2025), who argue that students need clearer guidance, usability support, and stronger awareness of library services in the digital era.

The fifth theme highlights the need for an integrated user experience-based digital transformation model. Participants expected library services to be easier to access, better integrated, more responsive, and more actively promoted. Students wanted a simple digital service interface that could connect catalogue search, repository access, e-journal links, borrowing information, and help services in one service flow. Lecturers expected reliable academic resources and faster support for teaching and research needs. Librarians expected stronger training, clearer service standards, and better technical support. One technology staff member explained, “The system can be improved, but we need coordination between service units, librarians, and user feedback.” These findings show that digital transformation requires not only system development, but also institutional coordination, staff capacity, service evaluation, and continuous user involvement.

Based on these themes, the study proposes that a user experience-based digital transformation model for academic library services should include five interconnected elements. The first element is user-centred access, which refers to simple, flexible, and task-oriented digital service pathways. The second element is interface and information clarity, which includes clear menus, search instructions, service categories, and visual consistency. The third element is librarian-mediated digital support, which positions librarians as facilitators of digital service use. The fourth element is digital literacy development, which includes orientation, tutorials, workshops, and peer-based support. The fifth element is continuous user feedback, which allows the library to

evaluate and redesign services based on real user experience. These elements show that improving service quality requires a balance between technology, people, process, and user meaning.

Discussion

The findings indicate that digital transformation in academic libraries should be understood as a user experience-centred service change rather than a purely technical modernization process. Users valued digital library services when they helped them complete academic tasks more efficiently. However, they also experienced barriers when service design, navigation, instructions, and support mechanisms did not match their needs. This finding strengthens the argument that successful digital transformation depends on how users perceive, interpret, and use digital systems in real academic contexts. It also supports the view that technology adoption in libraries is closely related to usefulness, ease of use, service trust, and institutional support (Lu & Lin, 2025).

The finding on digital access as academic convenience is consistent with previous studies showing that digital library services improve access to information and support academic productivity. Muslim (2024) found that digital transformation can improve access, user experience, and knowledge management in academic libraries. Similarly, Okunlaya et al. (2022) argued that digital innovation can support university education when it is connected to user needs and learning processes. The present study adds a qualitative perspective by showing that users do not define digital transformation in abstract technological terms. They define it through practical academic benefits, such as finding references faster, checking book availability, accessing repository documents, and receiving help without unnecessary delays.

The finding on user experience gaps also confirms earlier research on the importance of usability in library digital services. Nasution and Zulaikha (2023) emphasized that user experience is a key factor in the quality of library websites. Rabelo et al. (2024) also showed that student experience in academic libraries is shaped by service design, access, and relevance to academic needs. However, this study extends previous findings by showing that usability problems are not only technical. They are also educational and cultural. New students may hesitate to use digital systems because they do not fully understand academic search behaviour, repository functions, or library terminology. Therefore, digital transformation must include user education and not only interface improvement.

The role of librarians in this study offers an important perspective. Digital services did not reduce the need for librarians. Instead, they changed the form of librarian support. Librarians became mediators between users and digital systems. This finding challenges the assumption that digital transformation is mainly about automation. In practice, users still need human guidance to interpret search results, select credible sources, use databases, and understand service procedures. This aligns with Barfi et al. (2023), who explain that service quality in academic libraries depends on both resource availability and staff responsiveness. It also supports the argument of Khoeini et al. (2024), who state that human resources are a core component of university library digital transformation.

Digital literacy emerged as a key condition for service quality. Users who had stronger digital and academic literacy could benefit more from digital library services. In contrast, users with limited experience often depended on peers or librarians. This finding shows that digital transformation can unintentionally create unequal service experiences if libraries do not provide adequate guidance. Kalota et al. (2025) found that students expect usable and ethical digital services, but they also require support to understand emerging technologies. The present study confirms this point in the Indonesian academic library context. Digital library services must be accompanied by orientation programs, short tutorials, visible instructions, and regular service promotion.

The findings also show that service integration is a major expectation among users. Participants wanted catalogue access, repository search, electronic resources, borrowing information, and online help to be connected in a simpler service flow. This result is relevant to the digital transformation model proposed by Khoeini et al. (2025), which emphasizes the importance of infrastructure, policy, human resources, and user-oriented planning. However, this study adds that integration should not only occur at the system level. It should also occur at the experience level. Users should not feel that each digital service stands alone. They should experience the library platform as one coherent academic support system.

From a theoretical perspective, the findings contribute to the literature on digital transformation and academic library service quality by integrating user experience as a central analytical lens. The study shows that service quality is not only determined by tangible facilities, digital collections, or system availability. It is also shaped by how users experience access, clarity, support, trust, and usefulness. This supports user experience theory, which views interaction quality as the result of user needs, system design, emotional response, and contextual use. It also strengthens service quality theory by showing that responsiveness, reliability, assurance, and empathy remain relevant in digital academic library services.

From a practical perspective, the study suggests that academic libraries should develop digital transformation strategies based on continuous user feedback. Libraries need to conduct regular usability evaluations, simplify service menus, provide digital literacy training, strengthen online help services, and improve coordination between librarians and technology staff. Library managers also need to treat digital transformation as an ongoing service improvement process. They should not stop at launching a website, repository, or catalogue system. They must monitor whether users understand, trust, and benefit from these services. In this sense, user experience becomes an evaluation tool and a design principle.

This study also offers implications for higher education institutions. University leaders need to support library digital transformation through adequate infrastructure, staff development, clear policies, and integration with academic systems. Digital library services should connect with teaching, research, publication support, and student academic development. If the library is positioned only as a supporting unit, its digital transformation may remain fragmented. If it is positioned as part of the academic ecosystem, its services can contribute more directly to learning quality, research productivity, and institutional knowledge management.

Despite its contribution, this study has limitations. The research focused on one academic library, so the findings may not represent all higher education libraries in Indonesia. The study also emphasized user experience and service quality rather than technical system performance. Future studies can compare several university libraries with different accreditation levels, institutional sizes, or digital infrastructure conditions. Further research may also use mixed methods to test the proposed user experience-based model quantitatively. Another possible direction is to examine how artificial intelligence, mobile library services, and data analytics affect user experience in academic libraries.

Overall, the results show that a user experience-based digital transformation model can improve academic library service quality by connecting technological systems with user needs, librarian support, digital literacy, and continuous service evaluation. The main contribution of this study lies in its emphasis on lived experience. Digital transformation becomes meaningful when users can access services easily, understand available resources, receive responsive assistance, and feel that library services support their academic work. Therefore, academic libraries need to design digital transformation not from the system outward, but from user experience inward.

4. Conclusions

This study concludes that digital transformation in academic library services becomes meaningful when it is designed from the perspective of user experience. The findings show that users value

digital library services because they support faster access to academic resources, reduce dependence on physical visits, and improve the efficiency of learning, teaching, and research activities. However, the study also found that the availability of digital systems does not automatically improve service quality. Users still face challenges related to unclear navigation, fragmented service menus, limited service promotion, uneven digital literacy, and dependence on librarian assistance. These findings confirm that academic library digital transformation must integrate technology, human support, user education, and continuous service evaluation.

The study contributes theoretically by positioning user experience as a central lens in understanding digital transformation and service quality in academic libraries. Practically, the findings suggest that academic libraries need to simplify digital service interfaces, strengthen librarian-mediated support, improve digital literacy programs, and develop regular user feedback mechanisms. From a policy perspective, university leaders should support library transformation through adequate infrastructure, staff training, clear service standards, and integration between library systems and academic activities. Future studies can expand this research by comparing several academic libraries, applying mixed methods, or testing the proposed user experience-based digital transformation model in different institutional contexts.

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