

UI/UX Design and Frontend Implementation in the Redesign of the National Archives Information Network Website

Siti Nur Rahmania^{1*}, Natswa Aulia Choirunisa², Cindy Tri Wahyuni³, Agung Brastama P⁴

^{1,2,3,4} Department of Information Systems, UPN "Veteran" East Java, Surabaya
23082010005@student.upnjatim.ac.id^{1*}, 23082010039@student.upnjatim.ac.id², 23082010040@student.upnjatim.ac.id³,
agungbp.si@upnjatim.ac.id⁴

Abstract

The National Archival Information Network (JIKN) serves as a digital platform that provides public access to archival information. However, the existing website interface showed several usability and visual design limitations that affected user experience and accessibility. This study aimed to redesign the JIKN website by applying User Interface (UI) and User Experience (UX) principles and implementing the redesigned interface into a functional frontend web application. The research approach involved problem identification, user needs analysis, wireframe design, prototype development, user testing, and frontend implementation. The redesigned interface was developed using PHP and Tailwind CSS to ensure responsiveness, consistency, and adaptability across various devices. The results demonstrated that the redesigned website offers a more modern visual appearance, improved navigation structure, and enhanced usability compared to the previous version. User testing indicated that the new interface increased user satisfaction and facilitated easier access to archival information services. Furthermore, the frontend implementation successfully transformed the design prototypes into a functional and responsive web interface while maintaining design consistency. In conclusion, the redesign and frontend implementation of the JIKN website improve accessibility, usability, and the overall quality of digital archival information services, thereby supporting a more effective user experience in accessing archival resources.

Keywords: UI/UX, Redesign website, Frontend implementation, php, tailwind css, Archival information system

1. Introduction

The rapid development of information and communication technology has brought significant changes across various sectors, including public services provided by government institutions. The utilization of websites as digital service platforms has become one of the primary strategies for improving information accessibility, service efficiency, and transparency for the public. In modern digital environments, websites are not only expected to provide comprehensive information but also to offer attractive visual designs, ease of use, and a positive user experience. Therefore, the implementation of User Interface (UI) and User Experience (UX) principles has become an essential factor in the development of modern websites.

User Interface (UI) focuses on the visual and interactive aspects of a system, including layout design, color schemes, typography, and other interface elements. Meanwhile, User Experience (UX) concerns the overall experience users have when interacting with a website, including navigation efficiency, usability, and comfort in accessing information. A website with well-designed UI and UX can enhance user satisfaction, facilitate information retrieval, and improve the effectiveness of services provided by an organization.

The National Archival Information Network (Jaringan Informasi Kearsipan Nasional – JIKN) is a digital archival information platform managed by the National Archives of the Republic of Indonesia (ANRI) to provide integrated access to archival information. The platform plays a crucial role in supporting the dissemination of archival information to the public, researchers, and government institutions. However, observations of the existing JIKN website indicate that its interface can be further improved to better align with current web design trends and user expectations. In addition, several visual components and information presentation features have the potential to be enhanced in order to provide a more effective and engaging user experience.

Previous studies have demonstrated that the application of UI/UX approaches can significantly improve website quality. Takariyanto and Saian (2024) reported that UI/UX redesign using the User-Centered Design approach improved both website usability and visual quality [1]. Kurniyawan and Irwansyah (2025) found that user-oriented UI/UX implementation enhanced website usability and navigation effectiveness [2]. Furthermore, studies conducted by Sain et al. (2025) and Fadzar et al. (2024) revealed that user-centered website redesign processes resulted in interfaces that were more intuitive, attractive, and aligned with user needs [3], [4]. These findings highlight the important role of UI/UX design in improving the quality of digital services delivered through websites.

Although numerous studies have explored website redesign, most of them primarily focus on the interface design phase without implementing the proposed designs into functional websites. Furthermore, research concerning the application of UI/UX principles in archival information service websites remains limited. Therefore, there is a need for research that not only produces design prototypes but also implements them into a functional frontend website that can be evaluated in terms of both appearance and functionality.

Based on these issues, this study aims to redesign the National Archival Information Network (JIKN) website by applying UI/UX principles and implementing the resulting design into a frontend web application using PHP, JavaScript, and Tailwind CSS. The process includes problem identification, user needs analysis, wireframe and prototype development, user testing, and frontend implementation. The contribution of this study lies in producing a modern, responsive, and user-friendly website design while providing a functional frontend implementation that supports the improvement of digital archival information services. The results are expected to serve as a reference for the development of public service websites that prioritize user experience and community needs.

2. Research Metodology

2.1. Research Method

This study employed a qualitative research method to obtain an in-depth understanding of the National Archival Information Network (JIKN) website, user requirements, and areas for improvement in terms of user interface and user experience. The qualitative approach was selected because it enables a comprehensive analysis of existing website issues and provides insights into user needs for digital archival information services.

Data were collected through observation of the existing JIKN website, discussions with supervisors and stakeholders during the internship program, and a literature review of studies related to User Interface (UI), User Experience (UX), website redesign, and frontend development. The collected data served as the foundation for developing design solutions that align with user needs and website objectives. This study adopted the User-Centered Design (UCD) approach, which places users at the core of the design and development process. Through this approach, design decisions are based on user needs, characteristics, and expectations, resulting in a website interface that is more effective, efficient, and user-friendly.

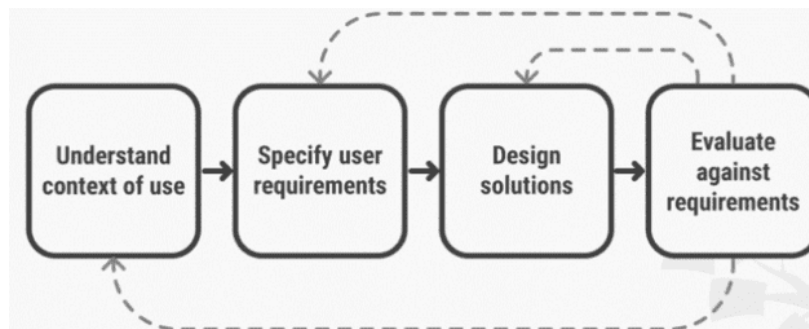


Fig. 1: Stages of the UCD Method [5].

The User-Centered Design (UCD) method consists of four interconnected stages [6], namely:

- a. **Specify the Context of Use**
This stage aims to identify the characteristics of users, their objectives, and the context in which they interact with the system. Information is gathered through observation and user analysis to gain a comprehensive understanding of the system's usage environment.
- b. **Specify User and Organization Requirements**
At this stage, the requirements of both users and the organization are identified. These requirements serve as the foundation for determining the features, functionalities, and objectives that the system must fulfill.
- c. **Produce Design Solutions**
This stage focuses on developing design solutions based on the identified requirements. The process includes creating user flows, wireframes, and prototypes that represent the proposed system before implementation.
- d. **Evaluate Design**
The final stage involves evaluating the proposed design through user testing to collect feedback on usability, navigation effectiveness, and overall user experience. The evaluation results are used to refine and improve the design to better meet user needs and expectations.

2.2. Research Stages

The research process consisted of several interconnected stages, as described below.

- a. **Problem Identification**
The first stage involved analyzing the existing JIKN website to identify issues related to visual design, navigation structure, information presentation, and usability. The findings from this stage were used to determine the scope of improvements and development objectives.
- b. **User Requirements**
At this stage, user requirements were identified based on the results of observations and literature studies. The analysis aimed to understand how users interact with the website and to determine the features and interface elements needed to improve the overall user experience.
- c. **Wireframe Design**

- After identifying user requirements, wireframes were created to establish the initial structure of the website. The wireframes illustrated page layouts, interface components, and navigation flows before proceeding to more detailed design stages.
- d. **Prototype Development**
The wireframes were then transformed into high-fidelity prototypes that provided a more detailed visual representation of the proposed website. These prototypes served as a basis for evaluating the design prior to implementation.
 - e. **User Testing**
The developed prototypes were evaluated through user testing to gather feedback regarding usability, navigation clarity, visual appearance, and overall user experience. The results of the testing process were used to refine and improve the design before implementation.
 - f. **Frontend Implementation**
The final stage involved implementing the approved design into a functional frontend website. The design prototypes were translated into program code to produce a responsive and interactive web interface that could be accessed through modern web browsers.

2.3. System Implementation

The frontend implementation of the JIKN website was developed using PHP, JavaScript, and Tailwind CSS. PHP was utilized to create a well-structured and maintainable website architecture, while JavaScript was employed to enhance user interaction and interface functionality. Tailwind CSS was used to accelerate interface development and ensure responsive and consistent visual design across different screen sizes and devices.

During the implementation phase, all design components developed in the wireframe and prototype stages were translated into source code while maintaining consistency with the approved UI/UX design. The implementation process emphasized usability, performance, responsiveness, and visual consistency to ensure an optimal user experience when accessing digital archival information services. The outcome of this study is a redesigned frontend version of the National Archival Information Network (JIKN) website that incorporates UI/UX principles and provides a more modern, responsive, and user-friendly interface for accessing digital archival information.

3. Result and Discussion

3.1. Specify the Context of Use

The first stage of the User-Centered Design (UCD) method was to understand the context in which the system is used. At this stage, observations were conducted on the National Archival Information Network (JIKN) website to identify its current condition and understand the characteristics of its users. The observation results indicated that the JIKN website has successfully fulfilled its function as a digital archival information platform. However, several aspects related to the User Interface (UI) and User Experience (UX) still required improvement. The main issues identified included a relatively simple visual appearance, a navigation structure that was not fully intuitive, and information layouts that appeared dense and less organized. These issues could reduce user comfort and efficiency when accessing archival information. Therefore, a website redesign was necessary to improve usability and enhance the overall user experience.

3.2. Specify User and Organization Requirements

The next stage focused on identifying both user and organizational requirements. Data collection was carried out through observations and questionnaire distribution to prospective users of the website. The results showed that users expected a more modern interface design, clearer navigation, and better-organized information presentation. From the organizational perspective, the Department of Library and Archives of Surabaya City expected the website to provide more effective digital archival services and improve public access to archival information. These requirements served as the foundation for designing the new UI/UX solution and guided the overall redesign process.

3.3. Produce Design Solution

3.3.1. Wireframe Design

Based on the identified requirements, the first design activity involved creating wireframes. The wireframes were developed to define the website structure, page layout, information hierarchy, and navigation flow without considering visual elements such as colors and typography. During this stage, each page was designed with a focus on information accessibility, content organization, and interaction efficiency. Key elements such as navigation menus, search features, main content sections, and action buttons were strategically positioned to facilitate user interaction and improve navigation throughout the website.



Fig. 2: Wireframe Homepage Design

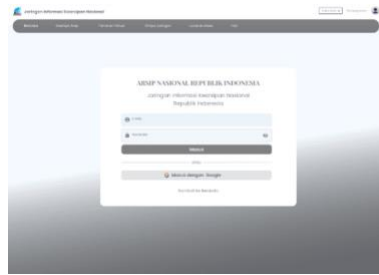


Fig. 3: Wireframe Login Page Design

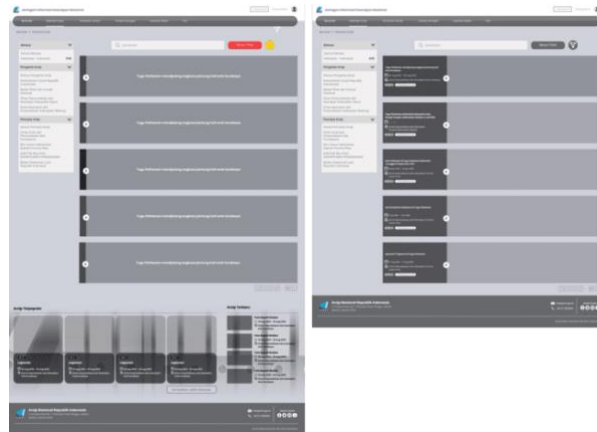


Fig. 4: Wireframe Archive Description Page Design

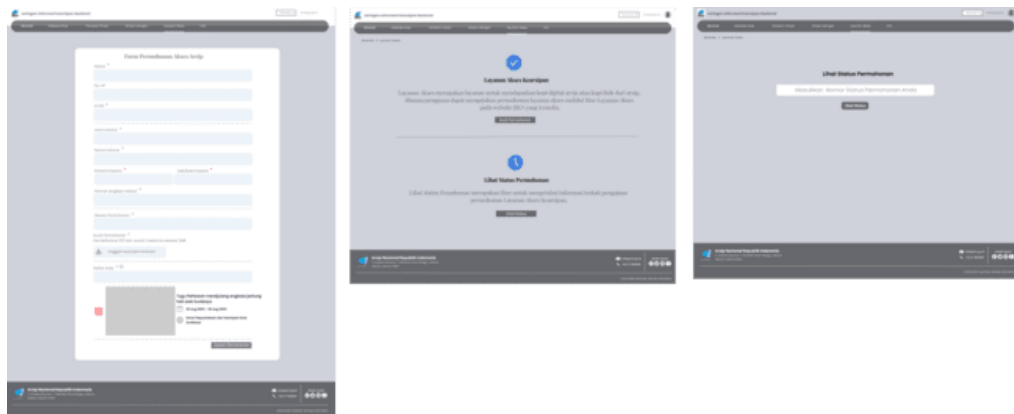


Fig. 5: Wireframe Archive Access Service Page Design

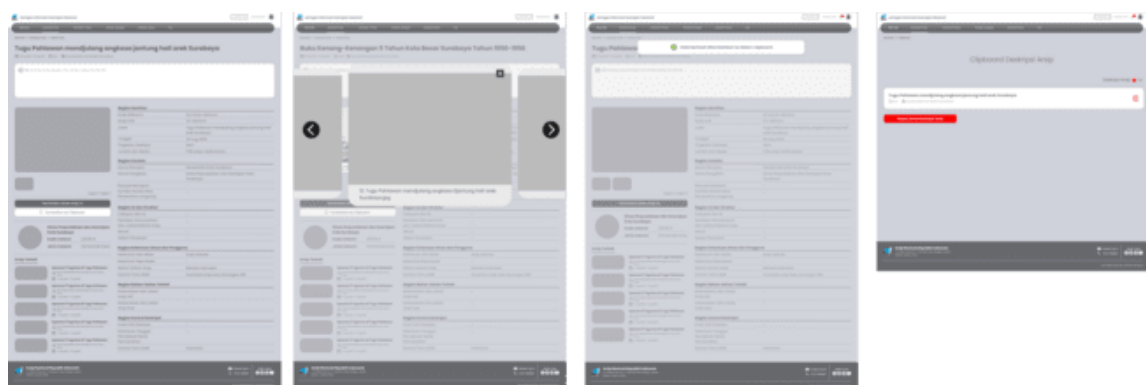


Fig. 6: Wireframe Archive Detail Page Design



Fig. 7: Wireframe Network Node Detail Page Design

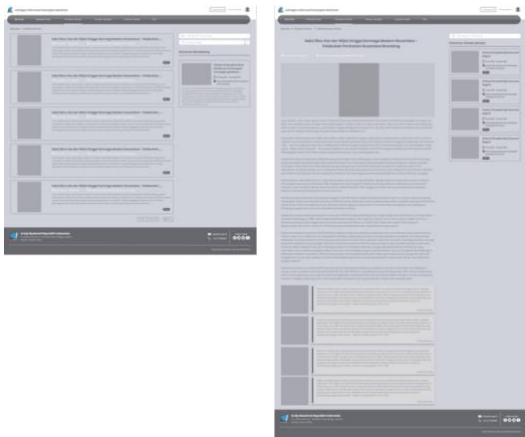


Fig. 8: Wireframe Virtual Exhibition Page Design

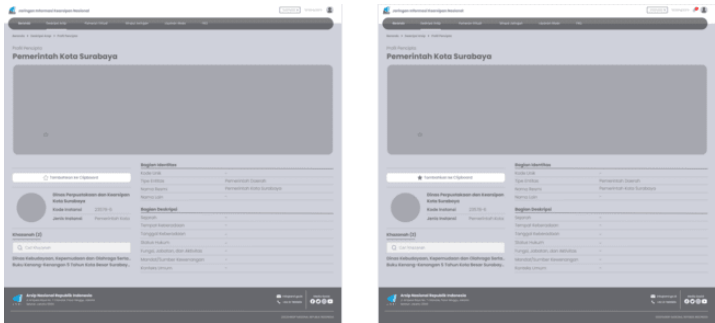


Fig. 9: Wireframe Archive Creator Profile Page Design

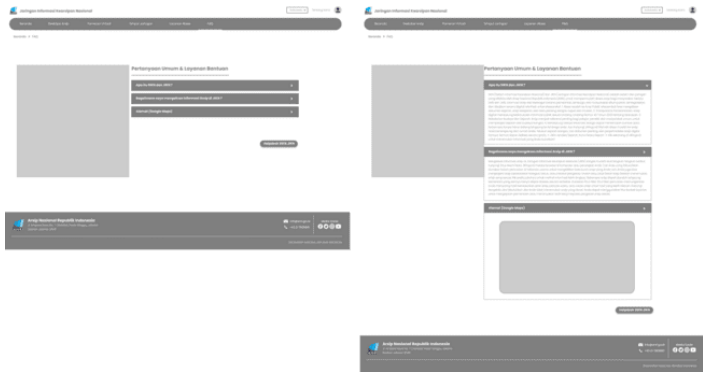


Fig. 10: Wireframe FAQ Page Design



Fig. 11: Wireframe Network Node Page Design

3.3.2. Mockup and Prototype Development

After completing the wireframes, the design process continued with the development of mockups and interactive prototypes using Figma. The mockups enhanced the wireframes by incorporating visual elements, including colors, typography, icons, and other interface components. UI design principles were applied to create a visually appealing, consistent, and user-friendly interface. The mockups were then transformed into interactive prototypes that allowed users to simulate website interactions before implementation. This stage provided a realistic representation of the user experience and enabled early validation of the proposed design solution.



Fig. 10: Flow Prototype Website JIKN

3.3.3. Frontend Implementation

Following the completion of the design phase, the approved prototype was implemented into a functional frontend website using PHP, JavaScript, and Tailwind CSS. All design components created during the wireframing and prototyping stages were translated into code while maintaining consistency with the original design. Tailwind CSS was utilized to develop a responsive and visually consistent interface across different screen sizes, while PHP was used to organize and manage website pages efficiently. The implementation resulted in a modern, responsive, and user-friendly frontend interface for the JIKN website.

3.4. Evaluate Design

3.4.1. Prototype Testing

The testing phase was conducted to evaluate the website prototype before its implementation into the frontend development stage. Testing was carried out using the Maze platform and involved five respondents representing the target users. The purpose of this testing was to assess the website's usability, ease of navigation, effectiveness of use, and to identify any issues that users might encounter while interacting with the designed prototype.

During the testing process, respondents were asked to complete several task scenarios representing the main activities within the website. These tasks included logging into the system, searching for archives, adding archives to the favorites feature, requesting archive access, accessing the Frequently Asked Questions (FAQ) page, and using the virtual exhibition feature. In addition to observing user interactions during task completion, questionnaires were distributed to measure user satisfaction with the proposed design. The evaluation focused on several aspects, including visual appearance, navigation clarity, design consistency, and overall website usability.

Based on the Maze testing results, all task scenarios achieved a 100% success rate. This indicates that all respondents successfully completed the assigned tasks without experiencing any failures. These results suggest that the website prototype is understandable and easy

to use for users. The login feature recorded an average completion time of 94.2 seconds with a misclick rate of 73.4%. The archive search feature had an average completion time of 29.1 seconds and a misclick rate of 63.3%. The favorites feature achieved an average completion time of 32.1 seconds with a misclick rate of 15.8%, while the archive access request feature recorded an average completion time of 9.2 seconds and a misclick rate of 37.5%.

The FAQ feature had an average completion time of 12.7 seconds with a misclick rate of 19.4%. Meanwhile, the virtual exhibition feature was the fastest task to complete, with an average completion time of 8.6 seconds and a misclick rate of 28.6%.

Table 1: Maze Prototype Testing Result

No	Feature	Success Rate	Average Completion ime (seconds)	Misclick Rate
1	Login	100%	94.2	73.4%
2	Search Archives	100%	29.1	63.3%
3	Add Archive to Favorites	100%	32.1	15.8%
4	Request Archive Access	100%	9.2	37.5%
5	Access FAQ Page	100%	12.7	19.4%
6	Use Virtual Exhibition Feature	100%	8.6	28.6%

Although all respondents successfully completed every assigned task, several features still showed notable misclick rates, particularly the login and archive search features. The relatively high misclick rates indicate that some interface elements may still cause confusion or incorrect interactions among users. Therefore, further evaluation and refinement of the interface layout, visual design, and navigation structure are necessary to improve the overall user experience and efficiency of website usage. Overall, the testing results indicate that the website prototype meets users' basic needs and demonstrates a good level of usability. The findings from this evaluation were used as the basis for improving and refining the design before proceeding to the frontend implementation stage.

3.4.2. Evaluation Result and Discussion

To evaluate the effectiveness of the redesign process, a questionnaire was distributed to five respondents before and after the implementation of the new design. The evaluation focused on several aspects, including visual appearance, design modernity, color consistency, typography, information organization, navigation, usability, and overall user comfort. The collected responses were analyzed using the mean score of each indicator to identify improvements resulting from the redesign process.

$$\text{Mean Score} = \{\sum X\}/N \quad (1)$$

$\sum X$ = total score obtained from all respondents

N = number of respondents

The redesign was conducted using the User-Centered Design (UCD) approach, which emphasizes user needs and feedback throughout the design process. User feedback gathered during the initial evaluation phase was used as the basis for creating wireframes, interactive prototypes, and the final user interface design. After the redesign was completed, respondents were asked to reassess the website using the same evaluation criteria.

Table 2: Presents a comparison of the questionnaire results before and after the redesign process.

No	Evaluation Aspect	Before Redesign	After Redesign	Improvement
1	The website appearance is visually appealing	3.4	3.8	+0.4
2	The website has a modern design and aligns with current web design trends	3.2	4.4	+1.2
3	The color scheme is consistent and visually comfortable	3.2	4.2	+1.0
4	The typography is easy to read and suitable for the website	3.4	4.2	+0.8
5	The information layout is well-organized and structured	3.4	4.4	+1.0
6	The website does not appear too crowded or confusing	3.8	4.0	+0.2
7	The navigation menu is easy to understand	3.2	4.4	+1.2
8	I can easily find the information I need	3.4	3.8	+0.4
9	The website appearance meets current user needs	3.0	4.2	+1.2
10	Overall, I feel comfortable using the website	3.4	4.2	+0.8
Overall Average		3.34	4.16	+0.82

Based on Table 2. Presents a comparison of the questionnaire results before and after the redesign process., the overall mean score increased from 3.34 before the redesign to 4.16 after the redesign, indicating an improvement of 0.82 points. This result demonstrates that the redesigned interface was perceived more positively by users compared to the previous version. The most significant improvements were observed in the indicators related to design modernity, navigation clarity, and suitability to current user needs, each increasing by 1.2 points. These findings suggest that the redesign successfully addressed several usability and visual design issues identified during the initial evaluation. Respondents also reported that the new interface appeared more contemporary and aligned with current web design standards.

In addition, improvements were found in the organization of information and color consistency, which increased by 1.0 point. The revised content structure, clearer visual hierarchy, and improved spacing contributed to a more organized and readable interface. Users were

therefore able to process information more efficiently and navigate the website with less effort. Although all indicators showed positive improvements, the smallest increase was found in the statement regarding website density and complexity, with an improvement of 0.2 points. This result indicates that while the redesign reduced some visual clutter, further optimization of content presentation and page structure may still be beneficial in future development.

To further evaluate user perceptions of the redesigned interface, additional questions were included regarding the redesign outcome. The results are presented in Table 3. User Evaluation of the Redesigned Website.

Table 3: User Evaluation of the Redesign Website.

No	Evaluation Aspect	Mean Score
1	The website redesign improved the visual appearance of the website	4.4
2	The new design makes the website feel more modern than before	4.4
3	I am more interested in using the website after the redesign	4.4

The results in Table 3. User Evaluation of the Redesigned Website. indicate that respondents strongly agreed that the redesign improved the overall appearance of the website. The average score of 4.4 out of 5 across all redesign-related statements demonstrates a high level of user satisfaction with the new design. Furthermore, respondents expressed greater interest in using the website after the redesign, suggesting that the updated interface successfully enhanced user engagement and perceived usefulness. Overall, the evaluation results demonstrate that the implementation of the User-Centered Design (UCD) method successfully improved both the User Interface (UI) and User Experience (UX) of the National Archival Information Network (JIKN) website. By involving users throughout the design process, the resulting interface better reflects user expectations and provides a more effective, modern, and user-friendly web experience.

4. Conclusion

This study successfully redesigned the National Archival Information Network (JIKN) website by applying User Interface (UI) and User Experience (UX) principles through the User-Centered Design (UCD) approach. The redesign process involved problem identification, user requirements analysis, wireframe creation, prototype development, user testing, and frontend implementation. The application of the UCD approach enabled the development of a design that better aligns with user needs and expectations.

The results demonstrate that the redesigned website provides a more modern visual appearance, improved navigation structure, and enhanced usability compared to the previous version. User testing indicated that the proposed design offers a more intuitive and comfortable experience when accessing archival information services. Furthermore, the frontend implementation using PHP, JavaScript, and Tailwind CSS successfully transformed the design into a functional and responsive website that maintains visual consistency across different devices. In conclusion, the redesign and frontend implementation of the JIKN website contribute to improving accessibility, usability, and the overall quality of digital archival information services. The outcomes of this study can serve as a reference for the development of other public service websites that prioritize user experience and user-centered design principles.

References

- [1] Takariyanto, A. D., & Saian, P. O. N. (2024). Perancangan Ulang User Interface dan User Experience Website Klinik Pratama Dr. Jo Menggunakan Metode User Centered Design. *IT-Explore: Jurnal Penerapan Teknologi Informasi dan Komunikasi*. Vol. 3 No. 2 (2024): IT-Explore Juni 2024 . doi: <https://doi.org/10.24246/itexplore.v3i2.2024.pp92-109>.
- [2] Kurniyawan, A. B., & Irwansyah. (2025). Redesign UI/UX dengan Metode SUS dan UCD pada Website Akademik UHAMKA. Vol. 9 No. 2 (2025): *METIK Jurnal* . doi: <https://doi.org/10.47002/g7qxc44>
- [3] Sain, M. I., dkk. (2025). Optimalisasi Pengalaman Pengguna: Redesign UI/UX Website SIMAKIP UHAMKA dengan Metode Design Thinking. *Jurnal Informatika dan Teknik Elektro Terapan*. Vol. 13 No. 1 (2025) . doi: <https://doi.org/10.23960/jitet.v13i1.5479>.
- [4] Fadzar, A., dkk. (2024). Rancangan Ulang UI/UX Website Sistem Informasi Kelautan Menggunakan Pendekatan Design Thinking. *Jurnal Informatika dan Teknik Elektro Terapan*. Vol. 12 No. 3 (2024) . doi: <https://doi.org/10.23960/jitet.v12i3.4613>.
- [5] Interaction Design Foundation. (n.d.). User-centered design. Retrieved June 9, 2026, from <https://ixdf.org/literature/topics/user-centered-design>.
- [6] I. S. Y. Saputri, M. Fadhli and I. Surya, "Penerapan Metode UCD (User Centered Design) pada E-Commerce Putri Intan Berbasis Web," *Jurnal Nasional Teknologi dan Sistem Informasi*, vol. 03, no. 02, 2017.