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Enhancing Repository Application *UI/UX* through Design Thinking Methodology

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ABSTRACT

This research discusses the application of Design Thinking methods in redesigning the user interface (UI) and user experience (UX) of an academic repository website. With the growing need for user-centered design, this research focuses on how a Design Thinking approach can be used to improve the usability and visual appeal of a repository website. The method includes five main stages: Empathize, Define, Ideate, Prototype, and Test, which were applied to deeply understand the user experience through interviews and observations. Data was collected using the System Usability Scale (SUS) and the results showed a low score, indicating major problems in the aspects of navigation, accessibility, and monotonous visual design. The results of this study showed significant improvements in website functionality and user satisfaction, achieving an average SUS score of 93.58, classified as "Excellent" (Grade A). The redesign process yielded a modern and minimalist interface that enables users to access features with ease, enhancing information retrieval and overall engagement. This research underscores the critical role of design thinking in creating accessible, aesthetically pleasing, and user-friendly interfaces that align with user needs. By prioritizing empathy and iterative development, the study highlights the potential of design thinking to revolutionize UI/UX design, ensuring impactful and satisfying digital experiences.

Keywords: *Design Thinking, Digital Repository, UI/UX Design, System Usability Scale, Web Design*

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INTRODUCTION

The application of design thinking in the development of user interface (UI) and user experience (UX) for website repositories has garnered significant attention in recent years. This research aims to explore the effectiveness of design thinking methodologies in enhancing the usability and engagement of websites, particularly in the context of digital repositories. The background of this study is rooted in the increasing importance of user-centered design approaches in the digital landscape, where the success of a website is often determined by its ability to meet user needs and expectations (Garett, Chiu, Zhang, & Young, 2016; Pellegrini, 2020).

A comprehensive literature review reveals that design thinking is a human-centric approach that emphasizes empathy, ideation, and iterative prototyping (Ansori, Hendradi,

& Nugroho, 2023; Saputra & Kania, 2022). This methodology encourages designers to deeply understand user experiences and challenges, leading to innovative solutions that enhance usability and accessibility (Sidabutar, Seah, & Singgalen, 2023; Sutresno & Singgalen, 2023). For instance, Sutresno and Singgalen highlight that employing design thinking in tourism website design results in aesthetically pleasing and functional interfaces that cater to diverse user needs (Sutresno & Singgalen, 2023). Similarly, Pellegrini discusses the shift from traditional design methods to user-based strategies, emphasizing the critical role of usability in influencing customer behavior (Pellegrini, 2020).

The results of various studies underscore the positive impact of design thinking on UI/UX design. Research indicates that applying design thinking principles leads to improved user satisfaction and engagement, as evidenced by enhanced usability scores in user experience questionnaires (Febrian, Adnan, & Putra, 2023; Milda Puspita & Apriyanti, 2023). For example, a study on mobile applications demonstrated that utilizing design thinking resulted in a user interface that effectively addressed user needs and preferences, thereby fostering a more satisfying user experience (Isadora, Hanggara, & Mursityo, 2021; Karmilasari & -, 2023). Furthermore, the iterative nature of design thinking allows for continuous feedback and refinement, ensuring that the final product aligns closely with user expectations (Br. Sihaloho, Fauzi, & Safitri, 2023; Herfandi, Yuliadi, Zaen, Hamdani, & Safira, 2022).

The integration of design thinking into the UI/UX design for website repositories not only improves user satisfaction, but also encourages innovation and accessibility. It is supported by the literature that a user-centered approach is critical to creating effective digital experiences, making design thinking a valuable methodology for web designers and developers (Ihmeideh, 2019; Ma & Hassan, 2024). In addition, the perception of users being satisfied with the responsiveness of websites, led this research to focus on improving aspects of the user interface (UI) to further enhance the user experience (UX). Research has shown that user satisfaction is closely linked to the quality of the UI, as it directly affects usability and the overall experience of navigating the site (Prasetya, Sari, Riyantoko, & Fahrudin, 2023; Winanti & Pangaribuan, 2020). By prioritizing UI improvements, this research aims to create a more seamless interaction that not only maintains the existing speed but also enhances visual appeal and functionality, ultimately leading to greater user satisfaction and retention. This approach aligns with findings that emphasize the importance of UI design in achieving educational and usability goals, as a well-structured interface can facilitate better understanding and engagement with the content (Krisnanik & Rahayu, 2021). Thus, focusing on UI design is a strategic move to elevate the user experience, ensuring that users not only appreciate the speed but also enjoy a more cohesive and satisfying interaction with the website.

The application of design thinking in UI/UX design for website repositories significantly enhances usability, user engagement, and overall satisfaction. The research underscores that design thinking's human-centered approach—emphasizing empathy, ideation, and iterative prototyping—enables designers to address user needs and

expectations effectively. Studies consistently show that this methodology results in interfaces that are both aesthetically pleasing and functional, aligning closely with users' preferences. Ultimately, the integration of design thinking in digital repositories not only improves accessibility but also promotes continuous innovation, making it an essential approach for creating impactful digital experiences.

METHOD

This research chose to use the Design Thinking method in conducting this research because of its user-centered nature and structured approach, which effectively improves UI/UX design. Design Thinking comprises five key stages: Empathize, Define, Ideate, Prototype, and Test, each playing a crucial role in creating a solution that aligns with user needs.

Figure 1 Design Thinking Stages

In the Empathize stage, designers focus on gathering deep insights into users' experiences and needs through interviews and observations. This allows the design team to better understand the challenges users face and their expectations from the system (Rahayu & Primajaya, 2023). The Define stage synthesizes the information collected during the Empathize phase, distilling it into a clear and actionable problem statement. This stage is essential for ensuring that the design solution is aligned with the users' requirements and expectations (Dorst, 2011).

Following the Define stage, the Ideate phase encourages the generation of a wide range of creative ideas, which can be explored through brainstorming sessions. This stage fosters innovation, enabling the design team to consider various potential solutions to the problem at hand (Centeno Alayón, 2023). Once promising ideas are identified, the Prototype stage begins, involving the creation of low-fidelity models of the proposed solutions. These prototypes serve as visual representations of the concepts and provide a means for facilitating feedback from stakeholders, ensuring that diverse perspectives are taken into account (Dykhnych, Olena, Yana, Svitlana, & Olena, 2022). Lastly, the Test stage allows for real-world evaluation of the prototypes, gathering feedback from users to identify strengths and areas for improvement. This iterative process not only ensures that the final design meets user expectations but also enhances overall user satisfaction, making it more functional and engaging (Lyu, Watanabe, Umemura, & Murai, 2023). Through this continuous loop of evaluation and refinement, Design Thinking guarantees that the solution is both innovative and user-friendly.

This research uses the System Usability Scale (SUS) to measure respondent's reactions to the website before and after the redesign. The SUS is a widely recognized tool

for assessing the usability of systems, including software applications and websites. Developed by John Brooke in 1986, SUS comprises a 10-item questionnaire designed to capture user's subjective perceptions of usability, providing insights into user satisfaction and experience (Maryati, Nugroho, & Indrasanti, 2022). Each item is rated on a Likert scale, producing an overall usability score that reflects the system's effectiveness. Higher SUS scores signify better usability, while scores below 68 are generally regarded as below average (Grier, Bangor, Kortum, & Peres, 2013). The simplicity and reliability of SUS make it applicable across various domains and technologies, from online learning systems to mobile applications (Hyzy et al., 2022; Soboczenski et al., 2019). Its effectiveness lies in providing quick, reliable measurements, which help designers and developers identify key areas for improvement in UI and UX design (Sari & Rasio Henim, 2022).

FINDING AND DISCUSSION

Empathize

The first stage of the Design Thinking process is to gather information regarding user experience and needs, focusing on the design aspects of appearance, navigation, and attractive interface elements. In this study, respondents were selected from the campus community to evaluate existing repository sites. This stage aims to understand the user's interaction with the site's appearance, identify visual elements that attract attention, and assess how intuitive the navigation is. Respondent data was collected through a distributed questionnaire and evaluated using the System Usability Scale (SUS), which indicated a need for design improvements.

Define

In this stage, a survey was conducted by distributing a form regarding users' experiences with the repository website provided. Users were asked to access the website and then provide reviews or feedback according to the form given. The purpose of this survey is to gather supporting data to identify the main issues and to understand users' specific needs. The following are the results of the survey conducted.

Table 1 User Experience Survey of Existing Journals

Aspect	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
I frequently visit the website.	15	10	5	3	2
I find the website easy to navigate.	5	12	10	4	4
I experience no difficulty searching for articles/journals.	3	10	8	6	8
The website's visual design is appealing.	10	13	7	3	2

The website looks modern and interesting.	6	19	5	2	1
The website loads quickly.	3	9	12	10	2
Menus and features are easy to understand and access.	3	13	10	7	4
I am satisfied with the website's overall usability.	2	20	6	4	2
I would recommend the website to others.	3	15	5	7	4
I feel confident using the website.	4	13	6	7	4

Based on the survey results, several issues were identified, including:

a. Low visit frequency indicates that the website lacks elements that can attract users to visit it regularly.
b. A complex and unintuitive navigation structure causes users to struggle in finding the information they need.
c. An insufficiently optimized search feature makes it difficult for users to find the desired journals.
d. An outdated and unappealing interface design decreases the user experience when accessing the website.
e. The website takes a relatively long time to load pages, which disrupts the user experience.
f. Menus and features that are difficult to understand and access cause confusion and make it challenging for users to interact with the website.
g. Low satisfaction levels result from features that are perceived as not meeting user needs, leading to an overall unsatisfactory experience.

Ideate

At this stage, wireframes are used as an initial framework to determine the position of important elements, such as navigation, access buttons, and search features. Wireframes serve as a visual discussion tool, allowing stakeholders to provide input on the layout without thinking about complex visual elements. In this journal, the Ideate stage

plays an important role in creatively exploring various design solutions, ensuring that key user needs are addressed from the start.

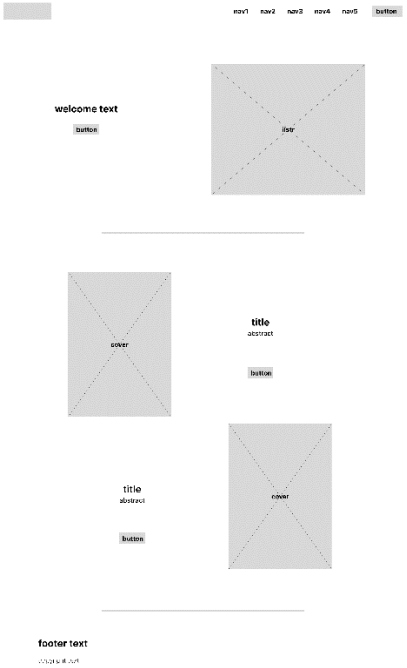

Figure 2 Wireframe Design

Prototype

At this stage, the development of the repository website interface is carried out and produces an initial visual model that represents the ideas from the previous stage. This prototype serves as an interactive simulation of the pre-designed design, allowing for initial testing of aesthetics, ease of navigation and functionality. With a prototype, it can make it easier for developers to identify design flaws and evaluate its effectiveness against user needs. In addition, through prototypes, users can provide direct feedback, so that the design can be refined before entering the final development stage. Here are some prototypes of the repository website that will be developed.

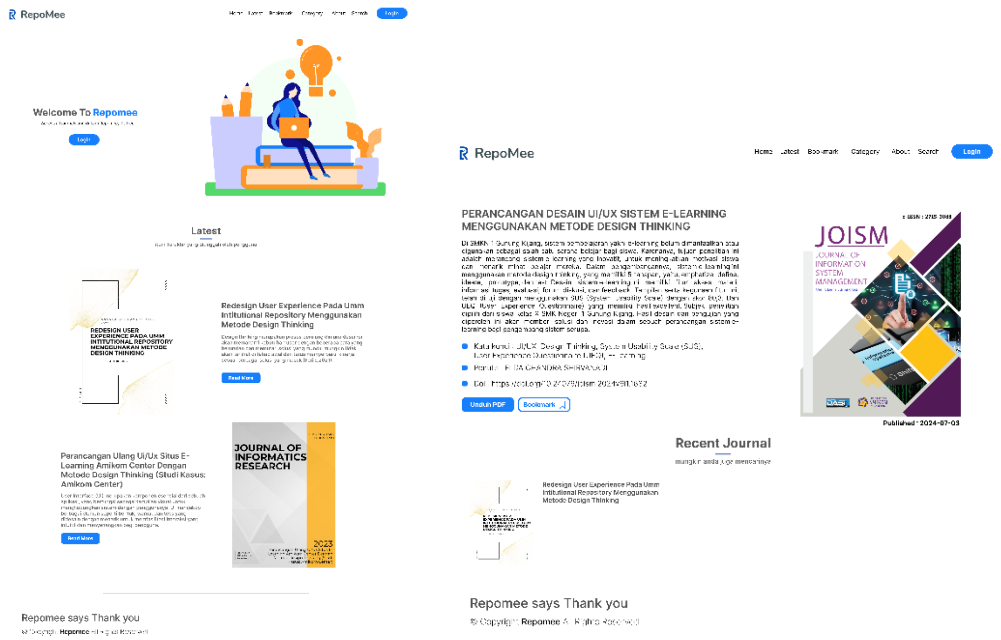

Figure 3 Homepage (Left) and Journal (Right)

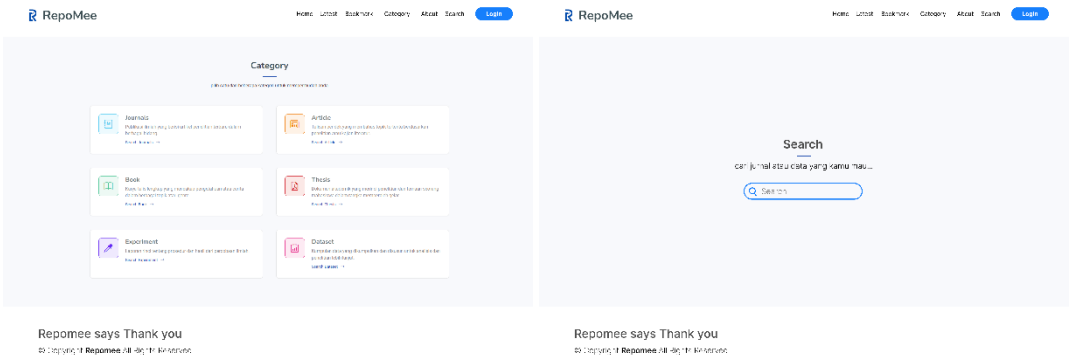

Figure 4 Category Page (Left) and Search Page (Right)

Test

The UI/UX design testing for the developed repository website was conducted using the System Usability Scale (SUS) method. This test aims to validate the effectiveness of the redesign and ensure the system functions well. The testing involved 30 respondents who were asked to interact with the developed website and then complete a form to measure user satisfaction levels.

Table 2 System Usability Scale Results

Resp	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
1	5	1	5	2	4	1	5	1	5	1
2	5	2	5	1	4	1	5	1	5	2
3	5	2	4	2	5	1	5	1	5	2

4	5	2	5	2	4	1	5	1	5	2
5	5	1	4	1	5	1	5	1	5	1
6	5	1	5	1	5	1	5	1	5	1
7	5	2	5	2	4	1	5	1	5	2
8	5	1	4	2	4	1	5	1	5	1
9	5	2	5	2	5	1	5	1	5	2
10	5	1	5	1	5	1	5	1	5	1
11	5	2	4	2	5	1	5	1	5	2
12	5	1	4	1	4	1	5	1	5	1
13	5	1	5	1	4	1	5	1	5	1
14	5	2	5	1	5	1	5	1	5	2
15	5	1	5	1	4	1	5	1	5	1
16	5	2	4	1	5	1	5	1	5	2
17	5	2	4	1	4	1	5	1	5	2
18	5	1	5	1	5	1	5	1	5	1
19	4	1	4	1	4	1	5	1	4	1
20	5	1	4	1	5	1	5	1	5	1
21	4	2	4	1	4	1	5	1	4	2
22	5	1	5	1	5	1	5	1	5	1
23	4	1	5	1	4	1	5	1	4	1
24	4	1	5	1	5	1	5	1	4	1
25	4	2	5	1	5	1	5	1	4	2
26	5	1	5	1	4	1	5	1	5	1
27	5	2	5	1	4	1	5	1	5	2
28	5	2	5	1	5	1	5	1	5	2
29	4	2	5	1	5	1	5	1	4	2
30	4	2	5	1	4	1	4	1	4	2

Based on the table above, the total score is 2807.5 with an average of 93.58. The results of this SUS test show that the repository website is included in the “Excellent” or “Grade A” category, which means that the website can be well received and high user satisfaction.

CONCLUSION

Based on the development that has been carried out on the repository website, it shows that the designed website has succeeded in improving user experience. Users can access various features easily and quickly. The features are easy to understand and speed up users in finding the desired information. A more modern and minimalist look provides an experience that makes users comfortable and increases engagement with the website. The results of the system usability scale (SUS) test amounted to 93,58, indicating a very

high level of user satisfaction with the “Excellent” category or Grade A. These results indicate that the developed repository website is well received and meets user needs.

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