UI/UX Design of a Web-Based Student Organizations System Using the Design Thinking Method Approach

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Article Information	Abstract:

Abstract:

A web-based Student Organization System (Student organizations) is a platform used to manage activities and information about student organizations in higher education institutions. However, in many cases, many existing systems lack an intuitive user interface (UI) and adequate user experience (UX), which causes difficulties in usage and a lack of user engagement. Therefore, this research aims to design a web-based Student organizations system using the Design Thinking method consists of five main stages: Empathize, Define, Ideate, Prototype, and Test. In this study, the first stage was conducted through interviews and surveys with users to understand their problems and needs. The next stage involved defining the identified issues, followed by brainstorming and generating design ideas that fit the requirements. The developed interface prototype was then tested through user testing to evaluate user experience and system functionality. The results of this study were a user interface design that is simpler, easier to navigate, and meets the specific needs of users. Testing of the prototype showed significant improvements in terms of ease of use and user satisfaction. Thus, the Design Thinking approach has proven to be effective in designing a web-based Student organization's UI/UX system that better aligns with user expectations. The hypothesis test accepted the application with a user reception rate of 86%. Thus, the system falls into the "very strong" category, who stated that a result percentage between 81% and 100% indicates a very high level of strength in testing. Therefore, the developed system is considered feasible for implementation.

INTRODUCTION

Student Organizations (Student organizations) in higher education have an important role in developing student potential, both in terms of leadership, skills and organization. As an integral element in campus life, Student organizations are often involved in various activities, such as seminars, training, regular meetings and social projects. Management of activities and administration in Student organizations requires an effective and efficient system to organize various information and communication flows between members, as well as to increase member involvement.

However, most of the systems used today, both desktop and web-based applications, often pay little attention to aspects of user experience (UX) and intuitive user interface (UI). Many systems tend to be complicated, confusing, or unresponsive to user needs. This leads to low adoption rates and user satisfaction, as well as increasing the time required to complete administrative tasks [1].

To overcome this problem, a web-based system redesign is needed by paying attention to user-friendly UX/UI aspects. One method that can be used to achieve this goal is Design Thinking [2]. The Design Thinking method focuses on deeply understanding user needs and creating innovative solutions by actively involving users in every stage of design development.

The Design Thinking method has five main stages, namely Empathize, Define (Problem Definition), Ideate (Idea Creation), Prototype (Prototype) [3], and Test (Testing)[4]. This approach is well suited to designing systems that truly meet user needs because the process is iterative and user centered. In this context, the Design Thinking approach will be used to design the interface and user experience of the web-based Student organizations system that is better, easier to use, and more efficient [5].

Previous research was conducted by Ansori, S., Hendradi, P., & Nugroho, S. (2023). Application of the Design Thinking Method in UI/UX Design of the SIPROPMAWA Mobile Application. In this case, the support relies on usability testing results achieving a final score of 86 and obtaining a B classification on the rating scale. Thus, this indicates that users really appreciate the usefulness of the Sipropmawa mobile application [6]; research conducted by Nurudin, A., Widyanto, R. A., & Sasongko, D. (2024). Application of the Design Thinking Method in Designing the User Interface of the Rifqitenda Application to Increase the Convenience of the Wedding Decoration Rental Feature. Based on the test results on the Rifqi Tenda application prototype using a usability testing labyrinth, a score of 81 and a System Usability Scale (SUS) was obtained, as well as a SUS score of 78.5, which is included in the good ranking. This shows that most users find this application easy to use [7]; The next research was conducted by Aldi, A., Mufidah, A. H., & Sanjaya, C. B. (2024). UI/UX Design of the Tour Package Booking Application in Wonokitri Village Using the Design Thinking Method. This method was chosen because it focuses on identifying user problems and needs and creating innovative solutions. In the testing phase, the prototype is tested by potential users to gather feedback. The test was carried out using Maze design resulting in a score of 88 from 23 respondents which shows that the average design of this application interface has gone well [8].

This research aims to design a web-based Student organizations system using the Design Thinking approach to generate better solutions in terms of user interface design and user experience. By adopting this method, it is expected that a system will be created that is not only functional but also attractive and easy to use, thus enhancing productivity and engagement among Student organizations members.

Designing a web-based system for Student Organizations (Student organizations) is of great importance, both in terms of organizational management and improving the quality of user experience (UX) and user interface (UI). Several reasons underlying the urgency of this research are as follows.

Improvement of Student Organization Management Quality: Student organizations in higher education institutions have various activities that involve members in administrative processes, communication, event management, and reporting. Without an effective and efficient system, the management of Student organizations activities often becomes complicated and poorly coordinated. A well-designed web-based system can enhance efficiency and orderliness in Student organizations management, allowing activities to be more

organized, transparent, and easily accessible to all members. This will make it easier for Student organizations administrators to carry out their duties and increase member engagement in every activity.

Support for Digital Transformation in Higher Education. In today's digital era, digital transformation in various aspects of life, including education, is increasingly necessary. The implementation of a web-based system for student organizations is an important step in supporting digitization in higher education. An effective system not only supports administrative management but also fosters changes in the way students communicate and collaborate. This is especially relevant given the need to adapt Student organizations activities to the rapidly advancing technology.

Increasing Efficiency and Member Engagement in Student organizations. One of the main challenges in student organizations is ensuring that members can easily get involved in every activity. Without a well-organized system, the planning, implementation, and evaluation of activities can become inefficient, which ultimately reduces member participation. With a web-based system designed with good UX/UI, Student organizations members can more easily access information, track activity progress, and collaborate with fellow members, thus increasing organizational engagement and productivity.

Enhancing Organizational Transparency: Transparency in managing activities and finances within an organization is a critical issue for all organizations, including Student organizations. A web-based system allows Student organizations administrators to manage and publish information transparently so that all members can monitor activities and decisions being made. With good design, this system can also provide reports that are easy to understand and accessible to all involved parties.

METHOD

Design Thinking is a problem-solving approach that focuses on a deep understanding of users and creating innovative solutions through a collaborative and iterative process. This method is highly useful in designing products or systems that can meet the real needs of users and provide an optimal experience [9]. In the context of designing the UI/UX of a web-based Student organizations system, Design Thinking helps the development team understand the challenges faced by users, and then design and test relevant solutions [10].

Design Thinking consists of five main stages that are structured yet flexible. Below is an explanation of each of these stages:
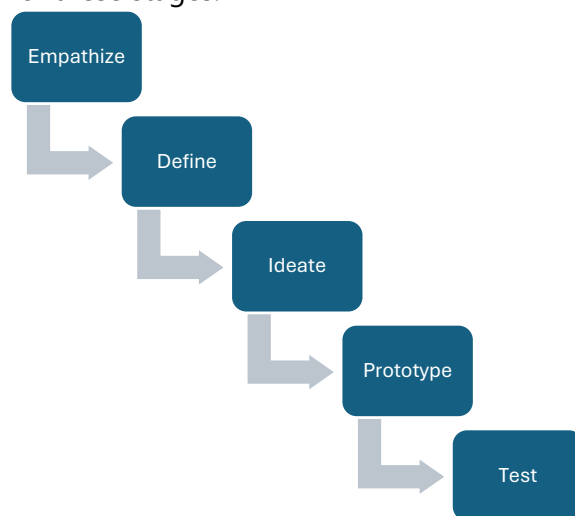

Figure 1. Metode Design Thinking [11]

1. Empathize

   The first stage in Design Thinking is to build a deep understanding of the users and the context of the problem they face. This process aims to uncover the needs, desires, and issues experienced by users through various research methods such as interviews, observations, surveys, and field studies. In this stage, developers strive to see the world from the users' perspective, understand their experiences, and identify unsolved challenges. Activities conducted in the Empathize stage include:

   a. Interviews with administrators and members of Student organizations to understand their experiences using the existing system [12].
   b. Observation of existing work flows and processes in student organizations [13].
   c. Collecting data through surveys to find out what users need and want most.

2. Define

   After gaining insight from the Empathize stage, the next step is to define the problem to be solved. At this stage, the information collected will be filtered and analyzed to produce a clear and focused problem statement [14]. A precise problem definition becomes the basis for the next steps, namely ideation and solution development. Activities carried out at the Define stage:

   a. Organize the findings from the Empathize stage and construct user personas to describe different user characteristics [9].
   b. Compile a user journey map to describe the user experience flow when using the Student Organizations system.
   c. Draft a problem statement that reflects the user's needs and problems to be solved.

3. Ideate

   At this stage, the development team brainstorms to produce various ideas and creative solutions to overcome the problems that have been defined. These ideas can be new features, interface design improvements, or system flow changes that can improve the user experience. It is important to explore possibilities without being limited by technical or resource constraints at this stage [15]. Activities carried out at the Ideate stage:

   a. Brainstorming sessions to generate various ideas and design concepts.
   b. Create sketches or wireframes to illustrate interface design ideas.
   c. Analyze and select ideas that best suit user needs and preferences.

4. Prototype

   After selecting the best ideas, the next step is to build a prototype that serves as an early representation of the proposed solution. This prototype does not have to be perfect, but it is enough to test the design concept and functionality that has been planned [16]. A prototype can be a sketch, an interactive wireframe, or an early version of an application that can be tested directly by users.

   Activities carried out at the Prototype stage:

   a. Develop an interactive prototype or mock-up of the user interface design.
   b. b. Create several design variations to test various possibilities.
   c. Using design tools like Figma, Adobe XD, and Sketch to quickly build prototypes.

5. Test

   The final stage in Design Thinking is testing the prototype with users to gather feedback and evaluate the effectiveness of the design. This testing aims to understand how users interact with the prototype and whether the system meets their needs [17]. Test results can be used to further refine the design or even start a new iteration if major problems are discovered. Activities carried out at the Test stage:

a. Conduct prototype testing with real users to observe their interactions and identify problems or difficulties.
b. Gather feedback through interviews, surveys, or direct observation.
c. Analyze test results to determine whether the proposed solution successfully meets design objectives.

RESULTS AND DISCUSSION

1. Results

a. Empathize

At this stage, researchers collected data independently through observation techniques and direct interviews with the head of the Computer and Business department, Mrs. Dwi Novia P, S.Kom, M.Cs. The interview process is presented in Figure 2.

Figure 2. Interview with department head

The main goal of this process is to gain a deeper understanding of users' needs and desires, so that researchers can better understand their problems and expectations. The information obtained related to user problems and desires is then presented in Table 1.

Table 1. System Problems

No	System Problem
1	Election colors and fonts optimal
2	UI/UX display less support for access using mobile devices
3	Use of icons that are difficult to understand and inconsistency in layout.
4	Too many unnecessary features

b. Define

At this stage, researchers clarify the results of interviews and observations with users to focus more attention on the main problems faced. Then, the collected data is analyzed and grouped using the affinity diagram technique. In this analysis process, several factors that need to be considered include: 1) Design consistency. This step aims to ensure consistent use of design elements, such as colors, fonts, and icons, so that users can easily understand the interface quickly; 2) Simple navigation. This step aims to design a menu structure and navigation settings that are easy to access and understand by all users, without being confusing or requiring a long learning time [18]; 3) Responsiveness and accessibility. This step aims to ensure that the system can be accessed properly on

various devices (desktop, tablet, smartphone) with optimal performance; 4) Focus on user needs. This step aims to identify and understand the needs of STUDENT ORGANIZATIONS members, so that the features provided can meet expectations and provide direct benefits in organizational activities.
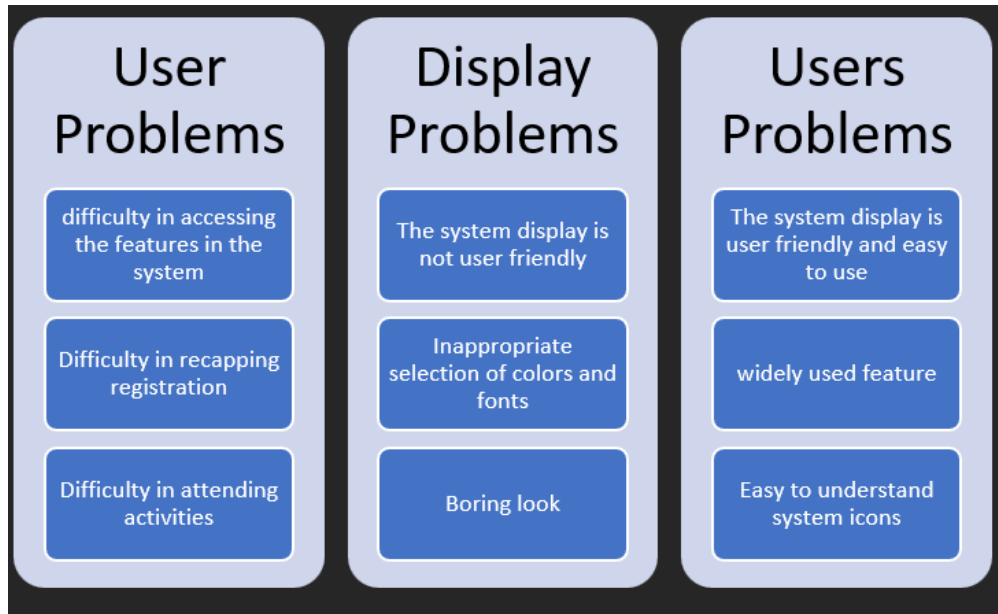

Figure 3. Defines

c. Ideate

The next step is to develop solutions to problems faced by users by prioritizing ideas. Prioritization of ideas is the process of determining the order or level of importance of ideas or features in product or service development. The goal is to determine which ones need to be prioritized for implementation first based on certain criteria.

Table 2. Dieate

No	Ideas and Solutions
1	Develop UI/UX designs that are easy for users to understand
2	Develop UI/UX design with a choice of colors, fonts and styles that are pleasant and comfortable for users to use
3	Choose an icon that is identical to the existing feature

In this research, the prioritization of ideas is divided into several categories, namely: Do It Now, Do Next, Do Last, and Do Later. Figure 4 shows a map of ideas that have been prioritized for designing the UI/UX of the Rifqitenda application [19]. This prioritization of ideas is produced through grouping a series of ideas identified as the main needs of users [20]. This process provides a clear picture of the strategic development direction and focuses on improving ease of use. Figure 5 below displays the results of prioritization of ideas.
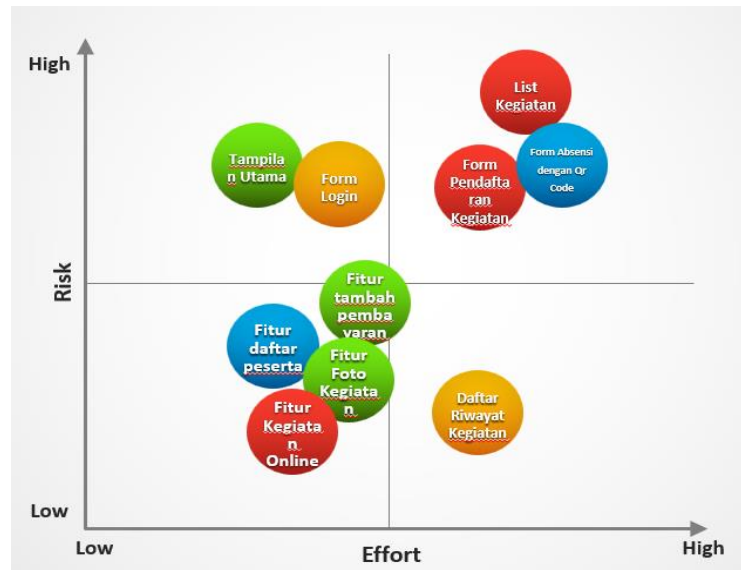
Figure 4. Prioritization of ideas

d. Prototype

The next stage is prototyping. At this stage, a model is created from the concept produced in the previous stage [21]. The use of prototypes allows testing and validation of product concepts before proceeding to the implementation phase [22]. Prototypes help ensure that proposed ideas can be implemented effectively and meet user needs. This prototyping stage consists of four steps, namely: user flow, feature list, wireframe, and mockup.

1) User flow

User Flow is a diagram that represents the steps taken by users in carrying out processes in the Web-based Student Organization System. This user flow helps users understand in detail the interactions within the Web-based Student Organizations System.

User Flow is needed to make it easier for users to follow the application flow and maximize the user experience. User flow, used to visualize in a structured manner how users interact with the Web-based Student Organization System. Figure 6 presents the user flow of the Web-Based Student Organization System, which depicts the flow of user interaction from start to finish in the student organization activity process. The user flow can be seen in Figure 6 below.
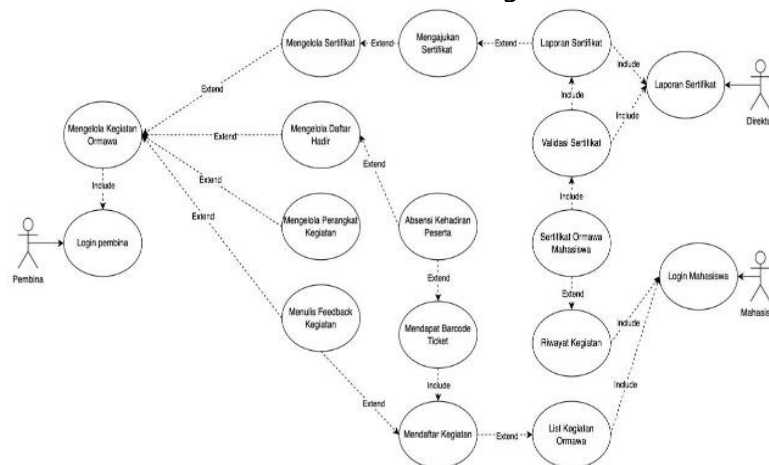

Figure 5. User Flow

2) Feature list

The designed user flow is used to determine the application's main feature list. This feature list provides a complete overview of the features presented by the Web-Based Student Organization System, ensuring optimal user experience and ease of student organization system processes. Table 3 displays the feature list available in the Web-Based Student Organizations System.

Table 3 Feature List

No	Feature list
1	Main View
2	Form Login
3	Activity List
4	Activity Registration Form
5	Attendance Form with Qr Code
6	Activity History List

3) Wireframe

A wireframe is a simple layout design created using Figma. The designed wireframe includes features, content, layout, and essential elements before being realized in the form of a mock-up design. A wireframe can be used to plan the overall layout of the tent rental application page, as well as determine the placement and function of key elements such as navigation buttons, data entry forms, and views. Figure 8 shows the wireframe of the web-based student organization system, displaying the initial layout and user interface elements designed to facilitate the tent booking process. This wireframe highlights the basic structure of the web-based student organization system interface. The wireframe of the web-based student organization system can be seen in Figure 6.
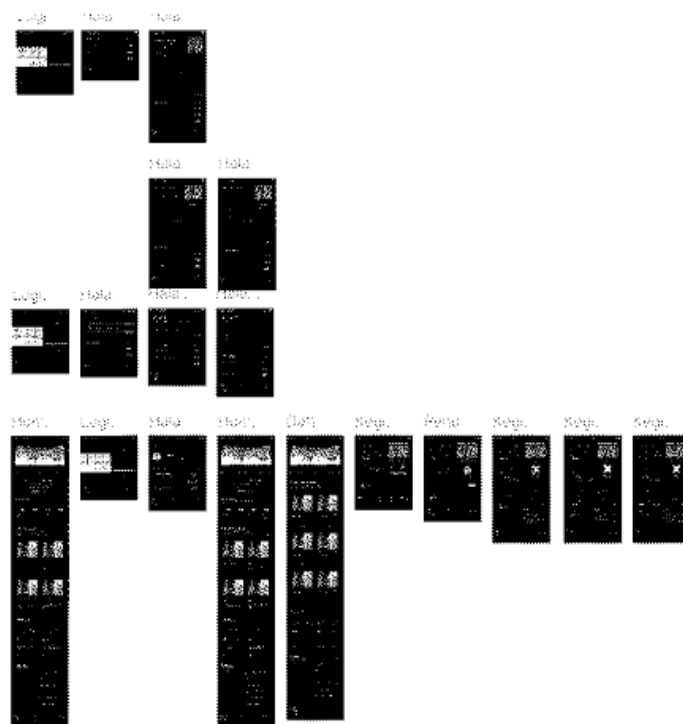

Figure 6. Web-Based Student Organization System Figma

4) Mockup

A mockup is a visual representation of a wireframe design that has been transformed into a more colorful and tangible design, providing a clearer picture of a project. The mockup displays the visual design of the user interface, including elements such as buttons, text, images, and icons. The mockup design reflects the identity of the student organization brand and ensures consistency with the established design guidelines. The mockup was created using Figma. The result of the mockup is the design that will be tested with users. The mockup is created based on the user flow and information architecture of the web-based student organization system. Figure 7 shows the mockup design of the user interface for the web-based student organization system.
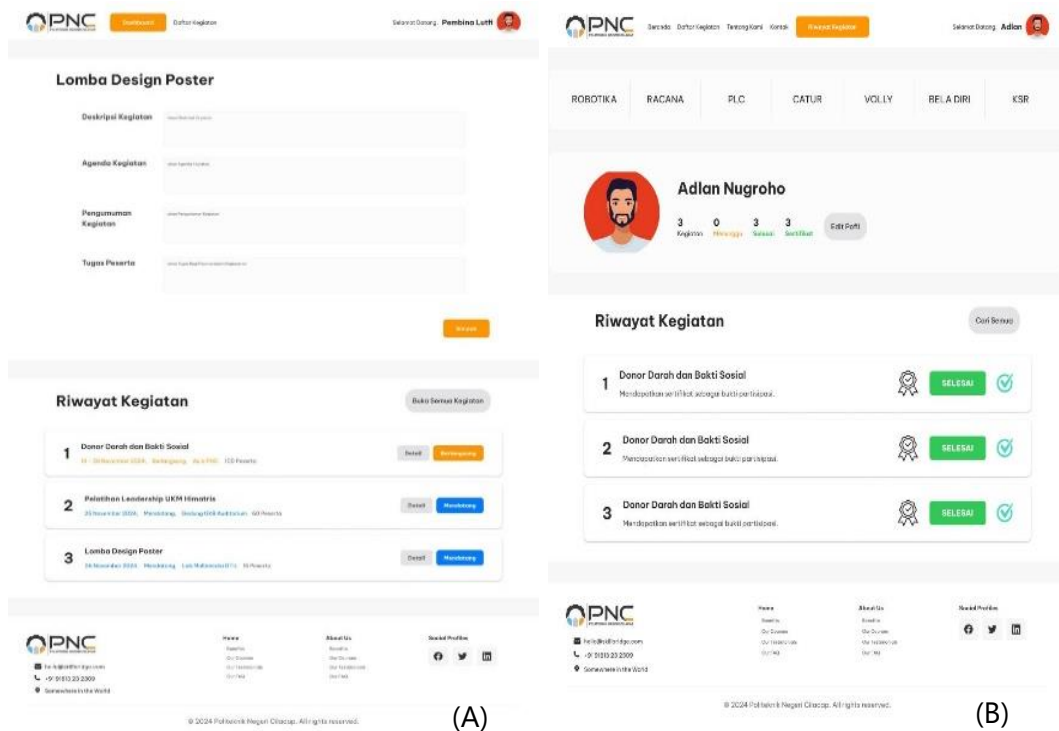

Figure 7. Main Display Mockup

Figure 8. (A) Activity View Mockup, (B) Activity History Display Mockup
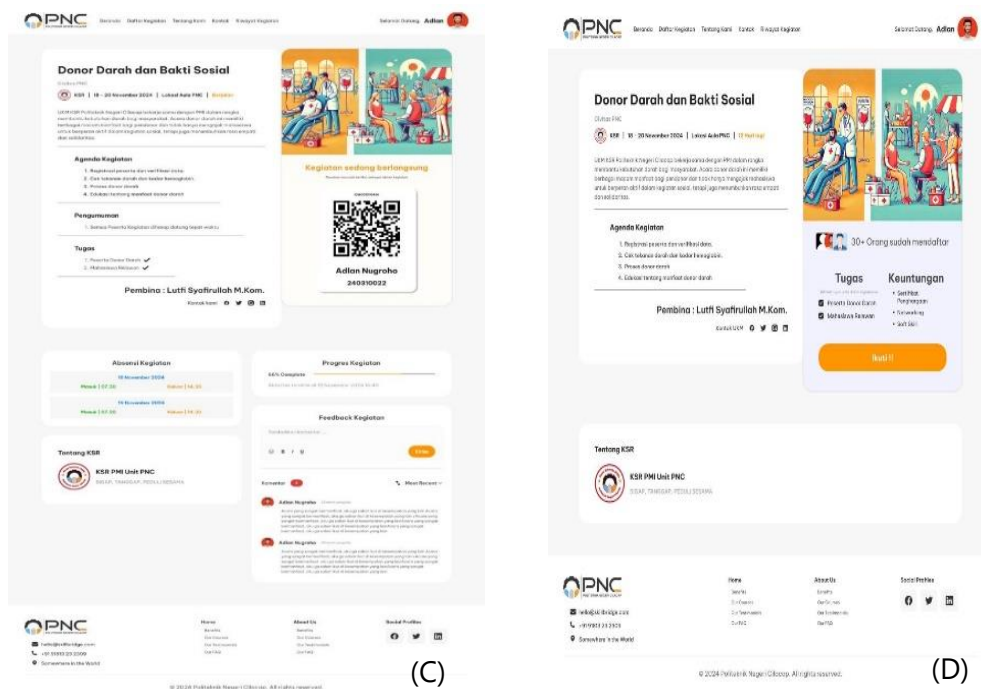
Figure 9. (C) Activity Attendance Display Mockup, (D) Active Activity View Mockup

e. Test

This testing step aims to verify whether the UI/UX features that have been created meet the expectations and needs of users. After the prototype is completed, testing is conducted on the resulting design by involving several members of student organizations who are potential users. This trial is carried out to determine how well the prototype addresses the defined problems. In this research, the procedure used is the

User Acceptance Test (UAT) [23]. The author suggests that testing be conducted over a consistent period to evaluate the performance of the developed application.

2. Discussion

UAT testing is carried out as below. The results of the UAT calculation can be seen in Table 4:

Table 4. Uat Results

| Question | Mark | | | | | Amount | Analysis (Amount/15) | Percentage (Analysis/5*100) |
	A x 5	B x 4	C x 3	D x 2	E x 1			
What? Is This Web-Based Student organizations System Ui/Ux Design Interesting?	45	28	0	0	0	73	4,8	97%
Is the information presented in the Web-Based Student organizations System Ui/Ux Design interesting and easy to understand?	40	28	3	0	0	68	4,5	90%
What? Where can the attractive Web-Based Student organizations System Ui/Ux Design be accessed?	30	32	6	0	0	63	4.2	84%
What? Can the Ui/Ux Design of the Web-Based Student organizations System be accessed easily?	30	28	6	0	0	64	4.26	85%
Is the the Ui/Ux Design of the Web-Based Student organizations System updated?	20	40	3	0	0	63	4,2	84%
What? the Ui/Ux Design of the Web-Based Student organizations System can monitoring?	30	28	6	0	0	64	4.26	85%
is search and filter data on the Ui/Ux Design of the Web-Based Student organizations System Enough Good?	10	48	3	0	0	61	4.06	81%
What? the Ui/Ux Design of the Web-Based Student organizations System walking with good?	25	36	3	0	0	64	4.26	85%

From the calculations in table 4 with the average value is 34.5 / 8 = 4.31 so percentage value is 4.31 / 5 x 100 = 86%. This matter test hypothesis accepted from application with test reception user is Good. Based on the results obtained, the system falls into the "very strong" category according to Riduwan (2008), who stated that if the percentage reaches between 81% and 100%, the test results can be considered very strong. Therefore, the researcher concluded that the system that has been designed and developed is feasible for implementation.

In the design of the web-based Student organizations UI/UX system, the application of the Design Thinking approach has proven to be effective in generating a design that aligns with the needs and expectations of users. By starting with the Empathize stage, the design team was able to better understand the context and challenges faced by Student organizations members. The iterative process, which involved prototype creation and testing, allowed the team to optimize the design and features based on direct feedback from users.

The system design also reflects the importance of collaboration in developing web-based products. User involvement from start to finish ensures that the final result truly provides a relevant and effective solution for Student organizations members in managing their activities.

Overall, the design outcomes contribute significantly to student organization management, with an emphasis on communication efficiency, information accessibility, and ease of activity management. This system can also serve as a foundation for future development that is more tailored to the evolving needs of Student organizations.

CONCLUSIONS AND SUGGESTIONS

This research aims to design a web-based Student organizations system using the Design Thinking method approach, focusing on improving the user interface (UI) and user experience (UX) to enhance efficiency, engagement, and user satisfaction in managing student organization activities. Based on the research results and the application of the stages in the Design Thinking method, several conclusions can be drawn as follows:

1. The Empathize stage shows that a deep understanding of user needs and challenges is crucial in designing an appropriate system. Interviews and observations conducted with Student organizations administrators and members helped identify key issues with the existing system, such as difficulties in navigation, lack of functionality, and a confusing interface design.
2. The Define process successfully produced a focused problem statement, namely the need to create a system that is easier to use, can be accessed quickly, and supports the management of organizational activities in a more structured and transparent way.
3. Through the Ideate and Prototype stages, the solutions produced were a simpler and more intuitive interface design, as well as features that support administrative processes, communication, and reporting in a more efficient manner. The developed prototype showed that the system could enhance usability and member engagement in Student organizations.
4. Feedback obtained in the Test stage indicated that testing the prototype with real users is essential for validating the proposed solutions. This testing showed that the developed prototype successfully improved UX and made it easier for users to carry out organizational activities.
5. This matter test hypothesis accepted from the application with test reception user is Good, with a percentage of 86%.

Based on the results of this research, several recommendations for further development are as follows:

1. Although the design and prototype have been tested and shown positive results, it is recommended that the system be implemented gradually. Further testing with more users and in various organizational contexts could provide more comprehensive insights for improvement.
2. Based on feedback from testing, additional features such as integration with the academic calendar, financial management for the organization, and automatic notifications for upcoming events could be considered to enhance the system's functionality.
3. To ensure that the system is accessible to a wide range of users, including those with disabilities, accessibility aspects in the interface design should be considered. For example, paying attention to text size, color contrast, and the system's ability to be accessed on various devices.

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