



Designing Student Internship Information System Interfaces Using the Design Thinking Method

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Abstract

Internship programs are essential for tertiary students to gain relevant experience before entering the workforce. Managing these programs, especially in institutions such as the East Java Province Marine and Fisheries Agency (DKP), poses challenges due to the reliance on paper-based processes and the need for centralized management across 17 branches. Therefore, this research developed a "Centralized Internship Information System" (CIIS) program designed with the aim of simplifying internship registration, student placement, document management, and program monitoring at DKP and its branches. This research focuses on designing a user-friendly interface for CIIS to address these issues. The design process follows the Design Thinking method, which emphasizes deeply understanding user needs and creating innovative solutions. The effectiveness of CIIS was evaluated using the Short User Experience Questionnaire (UEQ), which assesses user experience across key aspects. The UEQ results showed an average pragmatic quality score of 1.954 (excellent) and an average hedonic quality score of 1.856, with an overall average of 1.91. These results indicate that CIIS provides a high-quality user experience, facilitating easier access to internship opportunities for students, efficient candidate selection for companies, and effective monitoring for internship managers at DKP.

Keywords: Design Thinking, Internship, Interface Design, Short UEQ, Website

1. INTRODUCTION

In the world of higher education or undergraduate level, internship programs for students are very important to gain experience appropriate to their study program. Internships are also something that students must take part in to increase their experience before entering the world of work. Managing internships often requires an information system to facilitate internship students in registration, selecting an internship location, monitoring student progress, and final evaluation [1], [2], [3], [4].

There are various kinds of internship programs in Indonesia, such as the Merdeka Campus program which is organized by the Ministry of Education, Culture,



Research and Technology (*Kemdikbudristek*), in the program there are certified internships that are implemented in collaboration with various companies so that students can register themselves at the company they want to go to through the portal. Kampus Merdeka website [5]. Not only that, but some internships are also independently managed by companies where students must register by contacting or meeting employees from the target company. In the case study taken, the East Java Province Maritime and Fisheries Service (DKP) is included in an independently managed internship [6].

Internships at DKP require a process until they are accepted, such as meeting with DKP, making an application or request for an internship, and getting an answer on whether they are accepted or not. The management of internships at DKP itself is not adequate because it still relies on paper and has not been digitized systematically. Moreover, internship acceptance from 17 DKP branches must also be managed at the central branch. This is enough to make the internship acceptance documents from various branches less able to be managed properly. and seems complicated.

The user interface (UI) of an internship information system must be well designed so that it is easy to use by all related parties, including students, DKP, and program managers. These challenges include a good understanding of user needs, intuitive design, and seamless integration with existing system functions [7]. Therefore, the research is focused on designing the interface of an internship information system called the "Centralized Internship Information System" (CIIS) intending to overcome the problems that have been identified. CIIS will be designed in a website format which will have features for internship registration, student placement, document management, and monitoring of the entire internship program at DKP East Java Province and its 17 service branches.

The CIIS design process will follow the design thinking method, this is because this method is very relevant in designing information system interfaces with a focus on an in-depth understanding of user needs and creating innovative and satisfying solutions for users. By applying the design thinking method, interface designers can ensure that the resulting solution will be effective, efficient, and attractive to users [8], [9], [10]. It is hoped that this research can make a real contribution to improving the user experience in using the system. In this way, students can more easily access information about internship opportunities, partner companies can be more efficient in selecting internship candidates, and program managers can be more effective in monitoring and evaluating student progress during internships.

The goal of this research is to design a user interface for a centralized internship information system that can solve internship management problems at DKP. The audience of this research includes students and DKP parties involved in internship

management. The purpose of this research is to contribute to improving the user experience when using the system, so that students can more easily access information about internship opportunities, partners can be more efficient in selecting internship candidates and can be more effective in monitoring and evaluating student progress during internships.

The East Java Province Marine and Fisheries Service (DKP) has problems in managing internships. Management still uses a manual system with submissions that must be made directly at DKP and the absence of digital data and document archives. In addition, the many DKP branches spread across several regions in East Java also face the same problem, making it quite difficult for the central branch to manage them. The solution to this problem is to create an internship management information system, which will help in managing internships to be digitized and efficient. Thus, students can more easily access information about internship opportunities, partner companies can be more efficient in selecting internship candidates, and internship managers can be more effective in monitoring and evaluating student progress during internships.

2. METHODS

This research was conducted at the East Java Provincial Marine and Fisheries Service to develop an internship information system interface. The research method was carried out in stages, namely observation, interviews, literature studies, interface development, analysis and evaluation, and conclusions. In developing the interface, researchers used the Design Thinking method and testing using Short-UEQ. A step-by-step visualization of this process is shown in Figure 1 for more details.

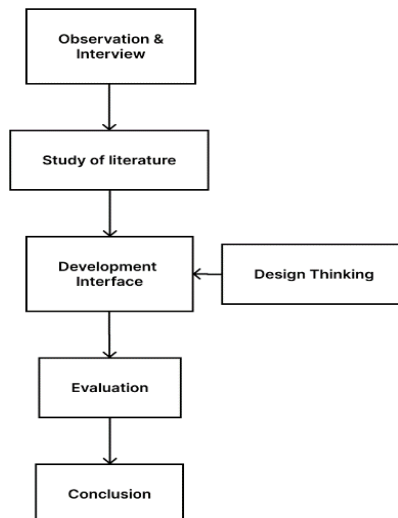


Figure 1. Research methods

1) Observation & Interview

The first stage of this research is observation and interviews. At this stage, researchers conducted observations and interviews with employees of the East Java Province Marine and Fisheries Service (DKP) to find initial problems that could be used as research topics. The problems identified focus on the management of internships and the development of a system that can assist related parties in managing internship students at the DKP office and its 17 branches.

2) Study of Literature

Literature study here the author uses 4 main reference articles. The first article was written by [11] about Applying Design Thinking to UI/UX design for an internship logbook application involves a sociological approach. This method focuses on understanding the social context, behaviors, and interactions of the users. By incorporating empathy and user insights, the design process becomes more inclusive and effective, leading to a user-friendly and engaging application. The second article was written by [12], this article explain about The development of the user interface for the Kolepa mobile app utilizes the Design Thinking method and the System Usability Scale. By applying Design Thinking, the process becomes user-centered, focusing on understanding and addressing the needs and challenges of the users. Additionally, the System Usability Scale is employed to evaluate the usability of the app, ensuring it is intuitive and user-friendly. This combination of methods aims to create an effective and engaging user interface for the Kolepa mobile app.

The third articles was written by [13], this article talking about The design of the Monteer app interface employs the Design Thinking method. This approach ensures that the design process is centered around the users' needs and experiences. By empathizing with users, defining their problems, ideating solutions, prototyping, and testing, the resulting interface is both intuitive and effective. This method aims to create a user-friendly and engaging interface for the Monteer app. The last article written by [8], this article explain about The redesign of the faculty website involves testing the user experience using the UEQ-S (User Experience Questionnaire - Short version). This process aims to enhance the website's usability and overall user satisfaction by focusing on key aspects such as attractiveness, clarity, efficiency, and dependability. By implementing the UEQ-S, the redesign process ensures a comprehensive evaluation of the user experience, leading to a more user-friendly and effective faculty website. The author uses these articles as references for the development of research conducted with different subjects, namely the East Java Province Marine and Fisheries Service (DKP).

3) Development Interface

The third stage is designing the system interface. At this stage, researchers designed the interface using the design thinking method, which is a problem-solving method that focuses on a deep understanding of user needs by involving several stages, namely empathize, define, ideate, prototype, and test[10]. The explanation of each stage is as follows:

- a) Empathize, In the first stage, namely empathize, this is needed to understand the problems, needs, and flow of internship management at the East Java Province Marine and Fisheries Service (DKP). This stage is carried out because design thinking emphasizes user aspects [8].
- b) Define, the second stage is defined, which is the next step after empathizing. At this stage, specific problems or needs that need to be resolved are formulated. The focus of this stage is to determine the objectives to be achieved in designing the system interface based on a deep understanding of the previous stage [9].
- c) Ideate, the third stage is ideated which requires a problem-solving process that has been determined at the define stage. This can be done through brainstorming by producing an internship information system interface wireframe which can later be developed in the next stage [9].
- d) Prototype, the next stage is prototyping, where at this stage a more concrete form is realized. Prototypes are created in the form of mockups or high-fidelity designs that allow users to evaluate how the flow and function can run well [13].
- e) Test, the last stage is test, where the prototype is tested by users directly and aims to collect valuable feedback from users about their experience in using the system, user satisfaction, and the effectiveness of the designed interface. The results of this test will be used to develop the interface design according to the user's wishes [8].

4) Evaluation

The fourth stage is analysis and evaluation. At this stage, researchers analyzed the information system and evaluated whether the system was in accordance with the needs designed at the previous stage. In addition, researchers also conducted user experience testing using the Short User Experience Questionnaire (Short UEQ) method. This method is an evaluation instrument used to measure user experience of a system or design with 8 aspects, namely support, simple, efficient, clear, exciting, interesting, creative, and leading [8].

5) Conclusion

The last stage is conclusion. At this stage, researchers draw conclusions related to the research conducted. Researchers identify the advantages and disadvantages of

the internship information system interface design that has been developed. The results of this analysis are then used to provide suggestions and recommendations for further development in the future. Thus, this research not only provides an evaluation of the existing system, but also offers guidance for continuous improvement and innovation.

3. RESULTS AND DISCUSSION

3.1. Design Thinking Results

3.1.1 Empathize

At this stage, researchers empathize with DKP employees by conducting observations and interviews by asking several questions to find information related to the problems currently experienced. Empathy is the stage of understanding users deeply to find out the needs, desires, and challenges they face. This involves gaining deep insight into the user's perspective and life. This stage requires a deep understanding of the problems that exist in DKP for interface development, this is very necessary to get good results for the next stage. The following are the questions asked in this stage:

Table 1. List of questions

No.	Questions
1	What are the obstacles to internship programs that are carried out manually?
2	What is the flow of students registering for internships?
3	How does the internship go to completion?
4	Have you ever used an application like a Learning Management System?
5	What convenience do you feel when using the Learning Management System application?
6	What features do you expect if this internship program is made into an application such as a Learning Management System?
7	Would it be helpful if there was an internship management information system here?

3.1.2 Define

The next stage is defined which aims to filter and synthesize the results of the empathy stage to articulate the main problem that needs to be solved, then this information is analyzed and identified into user needs related to interface planning. The following is a list of user needs that have been identified from the previous stage:

Table 2. List of User Requirements

No.	Requirements
1	It is difficult for students to register and choose an official office at DKP
2	Difficulty in providing student internship placements according to their majors
3	Difficulty in knowing exactly the total/recorded number of internship students and those who have completed their internship
4	Lack of monitoring of student activities or assignments at DKP carried out by employees
5	Employees have difficulty finding data on students who have done internships
6	Users or employees want to have an information system to manage internships at DKP

3.1.3 Ideate

Ideate is a stage that involves brainstorming and developing various potential ideas to solve the problem that has been defined. The focus is on quantity and creativity, without judging or limiting the ideas that emerge. At this stage, the ideas obtained in the previous process are implemented in a wireframe to develop an information system interface. The wireframe is the initial design of this interface which will later become a reference or guideline in the next stages in arranging the interface layout [12], [13], [14].



Figure 2. Wireframe

In Figure 2, this is a wireframe of the results of the ideate process. There are five panels, namely login, dashboard, internship, account, and task where each of these panels or features represents user needs that have been successfully identified previously. This wireframe will later be developed into a mockup or high-fidelity design so that in the next stage feedback can be done with related users.

3.1.4 Prototype

The prototype stage involves creating an interactive module in visual form, developed based on insights from previous stages. For this prototype, Figma, a web-based collaborative design platform, was utilized. Figma facilitates designing, wireframing, prototyping, and developing necessary designs. It also offers various collaboration features, such as FigJam, which enables team brainstorming and design development, as well as tools for creating simple diagrams [12], [15]. Figure 3 to 6 are the results of the prototype development.



Figure 3. Login Page

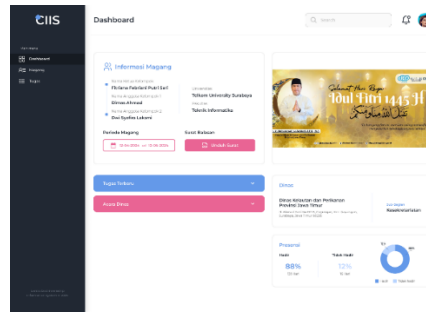


Figure 4. Dashboard Page

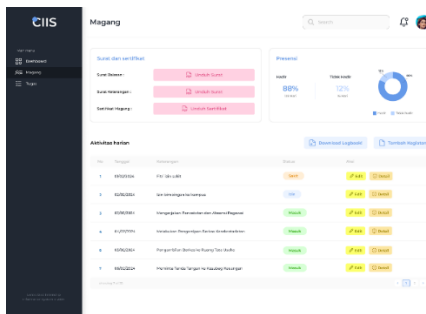


Figure 5. Internship Page

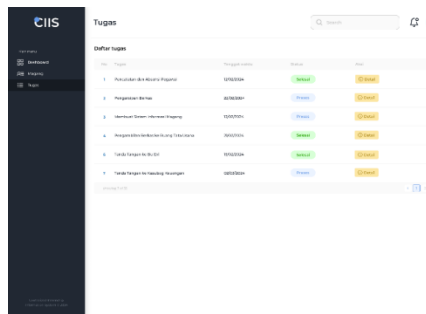


Figure 6. Task Page

The login page (Figure 3) is the initial interface of the designed information system. Users can log in or register on this page; however, only students seeking internships can register, as administrators and sub-department employees already have accounts. During the registration process, students need to fill in their personal information and attach a certificate from the faculty to apply for an internship at DKP. The dashboard page (Figure 4) serves as the main interface of the information system. Upon logging in, users can access various menus and view statistics tailored to their roles. For students, the dashboard displays information about internship members, internship periods, reply or acceptance letters from DKP, internship sites, assignments, and other supporting data.

The internship page (Figure 5) is designed to display crucial data such as reply letters, certificates, and internship certificates upon completion. This page also includes attendance statistics and a logbook for students to fill in daily during weekdays. The logbook tracks statuses such as admission, permission, and illness, which impact the overall attendance statistics. The assignment page (Figure 6) allows students to view tasks assigned by DKP. Students can update the status of their assignments to "complete" once they have finished the tasks. The completion of these assignments will influence the value of the certificate issued at the end of the internship process.

3.1.5 Testing & Evaluation

This stage is about testing the prototype with users to get feedback and see how the solution works in a real context. This information is used for further iteration and improvement. Testing was carried out using the Short UEQ method by assessing user experience based on several main aspects such as success, satisfaction, ease of use, stimulation, ease of learning, efficiency, control, and aesthetics. A short UEQ (User Experience Questionnaire) is an instrument designed to measure the user experience of a product or system quickly and effectively. This method consists of a standard set of questions that evaluate various aspects of the user experience, such as success, satisfaction, ease of use, stimulation, ease of learning, efficiency, control, and aesthetics[8].

User experience is an important aspect of an individual's interaction with a product, service, or information system, and how that experience is perceived by the user. This experience includes everything from the visual appearance of a product to the functional interactions, responsiveness, and emotions generated when using a product[16]. The assessment is carried out through a questionnaire using Google Form which consists of the assessment aspects that have been mentioned. Respondents rate the extent to which they agree or disagree with each statement using a Likert scale. After the data was collected and calculated using the Short UEQ Tools, the results appeared in the form of a graph explaining whether the system tested was good or unsatisfactory for the 37 respondents.

obstructive	o o o o o o o	supportive
complicated	o o o o o o o	easy
inefficient	o o o o o o o	efficient
confusing	o o o o o o o	clear
boring	o o o o o o o	exciting
not interesting	o o o o o o o	interesting
conventional	o o o o o o o	inventive
usual	o o o o o o o	leading edge

Figure 7. Assessment Aspects

In Figure 7 you can see eight (8) assessment aspects in the UEQ-S which were tested in the prototype using a Likert scale. From the test results, the level of ease, efficiency, clarity, interest, and familiarity of the user experience will be known [17]. The results of the assessment will be in the form of pragmatic and hedonic dimensions. The pragmatic dimension is an assessment that focuses on the usability and function aspects of the product which include how effective, efficient, and easy it is for users to achieve their goals by using the product. while the hedonic dimension is an assessment that focuses on the emotional aspects and user pleasure in using the product. Hedonic assessment includes the feelings of pleasure, satisfaction, and happiness that users feel when using a product.

Table 3. Test Results

Scale	UEQ Point	Status
Pragmatic Quality	1.954	Excellent
Hedonic Quality	1.856	Excellent
Overall	1.91	Excellent

It can be seen in Table 3 that the short UEQ test conducted resulted in an average pragmatic quality score of 1.954 which is very good and resulted in a hedonic average score of 1.856 with an overall average of both being 1.91. These results were obtained after obtaining feedback from users through a google form that was distributed.

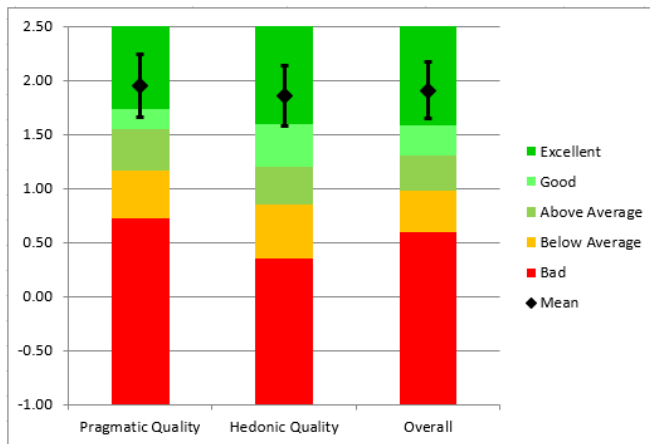


Figure 8. Test Results Graph

Figure 8 shows the results of the Short UEQ test graph which shows the quality of the information system is good and can be used. This graph is obtained from the results of data visualization using the formula in the short ueq tool, it can be concluded that the interface design carried out is of excellent value and can be implemented into an information system for internship management needs at the Department of Maritime Affairs and Fisheries (DKP) of East Java Province.

3.2. Discussion

In developing the Centralized Internship Information System (CIIS) using the Design Thinking method, researchers faced significant challenges. One major issue was that the Design Thinking method does not inherently support iteration. This limitation made it difficult to refine and improve the system continuously. Additionally, the success of the Design Thinking method heavily relies on user participation and feedback. If the user responses are not representative or comprehensive, the development process can encounter substantial obstacles.

Given these challenges, the researchers proposed combining the Design Thinking approach with the Scrum framework. This combination aims to address the shortcomings of the Design Thinking method. Scrum, known for its adaptability and iterative nature, can complement the Design Thinking process by introducing structured opportunities for revision and enhancement, particularly during the pilot stage.

Scrum's framework supports ongoing adaptation and iteration, which are crucial for refining the CIIS. User feedback collected during the pilot stage can be integrated into subsequent sprint reviews and iterations. This continuous feedback loop allows the development team to make necessary adjustments and improvements, ensuring that the system evolves in alignment with user needs and preferences.

Moreover, the sprint retrospective in Scrum plays a pivotal role in evaluating the feedback and making informed decisions for future iterations. By assessing the outcomes of each sprint, the development team can identify areas for improvement and implement changes that enhance the user interface design. This iterative process helps create a more user-centric and effective information system.

By merging Design Thinking with Scrum, researchers can leverage the strengths of both methodologies. This combined approach facilitates the creation of innovative solutions that are not only efficient but also closely aligned with user requirements. The iterative nature of Scrum, coupled with the user-focused principles of Design Thinking, provides a robust framework for developing a successful and user-friendly Centralized Internship Information System.

4. CONCLUSION

Based on the research conducted, it can be concluded that the application prototype developed using the Design Thinking method through various stages such as empathize, define, ideate, prototype, and test has successfully met the target requirements and user needs. This conclusion is reinforced by the results of testing with the Short UEQ method which produces a pragmatic average value of

1.954, a hedonic average value of 1.856, and an overall average value of 1.91. These results indicate excellent system quality, suggesting that users are very satisfied with the ease of use, functionality, and emotional satisfaction provided by CIIS. For future development, it is recommended that these tested interface design results be implemented to ensure that the information system continues to offer a great user experience.

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