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UI/UX Prototype Design of Employee Presence Application Using Design Thinking

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UI/UX Design,
Design Thinking,
Presence System,
System Usability Scale (SUS),
Mobile Application.

ABSTRACT

Employee Presence management is a crucial aspect of organizational productivity. However, manual Presence systems often result in inefficiencies, requiring alternative technological solutions. This study aims to design a UI/UX prototype for a mobile-based Presence application at Universitas Muhammadiyah Klaten using the Design Thinking approach. The research follows five stages: Empathize, Define, Ideate, Prototype, and Test. Data collection involved surveys and interviews with 62 respondents, including lecturers, staff, and education personnel. The prototype was evaluated using the System Usability Scale (SUS), resulting in a usability score of 76.6% in the "Good" category. The findings indicate that the proposed design effectively addresses the limitations of manual presence systems, enhancing user experience and efficiency. Future improvements include additional features such as a "forgot password" option, different presence button and broader usability testing. This study suggests that a well-designed presence application can streamline presence recording and improve operational effectiveness.

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INTRODUCTION

Good time management increases productivity and achievement of organizational goals (Amanda Anasty et al., 2023), included in recording the arrival and return of officers. This aims to set the duration and work system to be more optimal (Achmad Yani & Susy Rosyida, 2022). One of the records can be done with the signature of the employee or the attendance tool (Alfirahmi et al., 2023) namely with a checker machine.

Presence with a checker machine belongs to the manual category, has the advantage of not requiring electricity and internet, but the disadvantages include the need for paper, ink, storage space, risk of manipulation, and data corruption (Anggraeni & Khairullah, 2022). The development has shifted to digital presence such as finger scan and RFID (Ardiansyah & Rosyani, 2023), However, it still causes employees to gather when they are absent. Therefore, it is necessary to improve technology so that digital presence is more efficient without having to gather at one point.

Migrating from manual to app-based attendance is an interesting option, one of which is with Android applications (Armayani et al., 2021), considering that the majority of Indonesian people have used smartphones. We Are Social data recorded 353.8 million internet connections via smartphones, exceeding the total population (Fadilah & Sweetania, 2023). Before application development, it is necessary to design to define the requirements, architecture, and components, which are outlined in the UI/UX prototype. Therefore, a prototype of the mobile presence application interface at the

Universitas Muhammadiyah Klaten will be designed with SUS (System Usability Scale) analysis to measure user acceptance (Ilham et al., 2021).

In the research on the UI/UX design of the Multifunctional Student ID Card (KTM) application using the Design Thinking method, the objective is to integrate the KTM with attendance and parking features in the campus environment of Satya Wacana Christian University (UKSW). This research identifies key issues such as manual attendance systems and parking queues, and through five stages of Design Thinking (empathize, define, ideate, prototype, and test), the researcher designs and tests a prototype of the application using Figma. Testing was conducted using the System Usability Scale (SUS) method with 10 respondents, resulting in an average score of 75.75, categorized as good (B). The research findings indicate that this application has great potential in enhancing campus service efficiency, but still requires further development, such as features for book borrowing, faculty information, and user data security (Herdin Yohnes Madawara et al., 2022).

Research on the evaluation and improvement of Edunex's interaction design using the User-Centered Design approach (Mizani & Lubis, 2022), With Usability Analysis and User Experience Goals include effectiveness, learnability, and efficiency. The results show feature improvements with a completion rate of 100%, learnability (SEQ 6.9/7), efficiency (SUS 90/100), and user experience goal (IMI 6.7/7). The difference with this study lies in the methods used and approaches; Previous research redesigned existing interfaces, while this research will create an interface design from scratch.

There are other studies that analyze usability testing factors in the use of attendance on the SIA UTY website through usability testing and a survey of student error levels during attendance (Nuantra et al., 2022). The results showed a usability score of 76.22%, with 86.6% ease of learning, 80% retention, and 76.7% satisfaction. SIA Universitas Teknologi Yogyakarta is considered effective in supporting learning, but it still needs improvement in reducing attendance errors. The difference with this study lies in the approach. Previous research evaluates systems that are already running, while this research will analyze needs and design new prototypes.

Research that designed the interface of the mobile application for the attendance of junior high school teachers (Maulana et al., 2023), with the result that the interface is acceptable, but needs improvements to color and contrast for further development. The difference with this study lies in the needs analysis approach. This study uses a special method in needs analysis, while previous research does not.

The main challenge in this study is that the presence system at the Universitas Muhammadiyah Klaten is still manual and has not been computerized. Before building a mobile presence application, it is necessary to design an interface prototype using the Design Thinking method, which includes empathy, definition, ideation, and prototype. This method helps to understand the user's problem in depth and ensure a functional and user-oriented design (Reza et al., 2023). To measure user satisfaction after interacting with the prototype, the System Usability Scale (SUS) will be used (Rivanka et al., 2023)

METHODS

This research uses a qualitative method with a Design Thinking approach (Setiyani & Tjandra, 2022), which is an analytical and creative process involving users in needs analysis, feedback, and prototype creation (Syelviani, 2020). The main stages include Empathize, Define, Ideate, Prototyping, and Testing, with the initial stage of research starting from Empathize.

EMPATHIZE

The first stage, Empathize, is carried out through observation to understand the user's perspective, identify problems, and understand the user's needs (Sekali et al., 2023). This study involved employees of the Universitas Muhammadiyah Klaten through interviews or questionnaires. After the data is collected, the research continues to the Define stage.

DATA MINING

Data was collected through online questionnaires using Google Forms and direct interviews with strategic potential users with 10 questionnaires. The questionnaire contained questions related to the attendance system in the user environment, while the interviews explored their views, including questions about the existence of a new attendance system at the Universitas Muhammadiyah Klaten. A total of 62 respondents, consisting of lecturers, staff, and education staff with the following percentages :

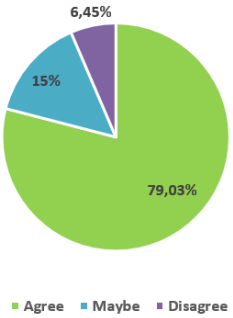

Figure 1 G-Form Respondent Data

Table 1 Questionnaire

No	Question
1	What is your experience using the current attendance application at Universitas Muhammadiyah Klaten?
2	Do you find it difficult to use your current presence?
3	How important is it for you for the Universitas Muhammadiyah Klaten to have a presence application that can be done within the Uversity without having to go to one place?
4	How important is it for you to have a presence app with an easy-to-use interface?
5	Do you feel that the current attendance tool is enough for your needs?
6	How important do you think the response speed of the presence app is?
7	Do you feel that the information displayed on the current attendance app is easy to understand?
8	How do you rate the attendance tool you are currently using?
9	How important is it that you can view your attendance history through the attendance tool you use now?
10	Do you want additional features such as attendance reminders or notifications on the app?

DEFINE

The Define stage aims to analyze and explore the results of Empathize, identify challenges, and formulate problems and solutions (Ulwan, 2021). At this stage, data from the Universitas Muhammadiyah Klaten is analyzed to detail user needs by using user personas that will be outlined in the prototype design. After the problem is formulated, the research continues to the Ideate stage.

Figure 2 User Persona

IDEATE

The Ideate stage continues the results of the analysis at the Define stage with a focus on developing creative concepts as a solution to problems (Wardani et al., 2023). The resulting concept is expected to meet the needs of users at the Universitas Muhammadiyah Klaten. This stage aims to formulate a solution strategy based on the challenges that have been identified. At this stage, the researcher analyzes the behavior and activities that will be carried out by users when using the presence application.

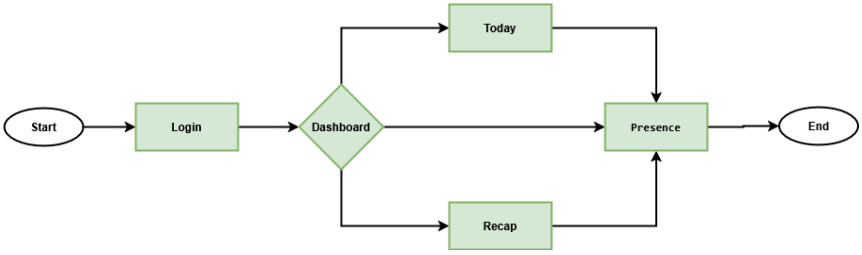

Figure 3 Mobile Presence User Flow

The following are the features in Mobile Presence in user flow:

1. User Flow Account Registration
2. User Flow Login
3. User Flow of Today's Attendance Data
4. User Flow Attendance Data Recap
5. User Flow Attendance
6. User Flow Sync Location

Next, a sitemap is created that serves as a guide in designing the application interface by organizing content, determining navigation flows, and information structures. Additionally, a sitemap helps identify potential errors before an application is developed, reducing the risk of failure. Here is a presence application sitemap compiled based on needs and user flow analysis.

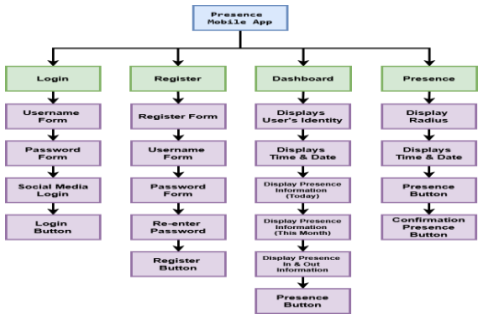

Figure 4 Mobile Presence Application Sitemap

PROTOTYPING

At this stage, wireframes and prorotypes are produced. The initial design was created based on the concepts and solutions from the Ideate stage. The goal is to describe the design design as a follow-up to the challenges that have been identified. The resulting prototype will be ready to be tested directly at the testing stage conducted on 3-5 employees of the Universitas Muhammadiyah Klaten, the number is considered sufficient to observe behavior patterns (Yudhanto et al., 2022). The test will be combined with the System Usability Scale (SUS), a simple instrument that measures usability levels through 10 questions on a scale of 1–5. The results of these measurements will determine the acceptance rate of the prototype that has been made.

WIREFRAME

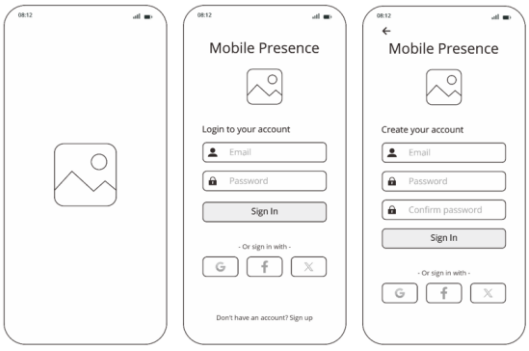

Figure 5 Wireframe of Home Page, Login Page and Register Page

Figure 6 Dashboard Page Wireframe

Figure 7 Presence Process Page Wireframe

PROTOTYPE

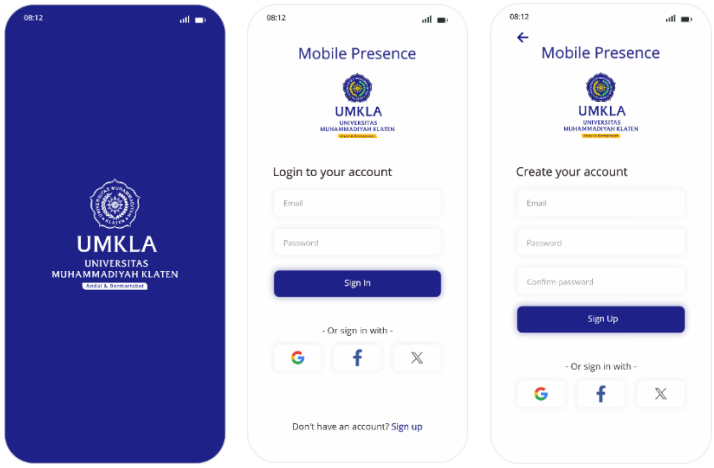

Figure 8 Prototype Home Page, Login Page and Register Page

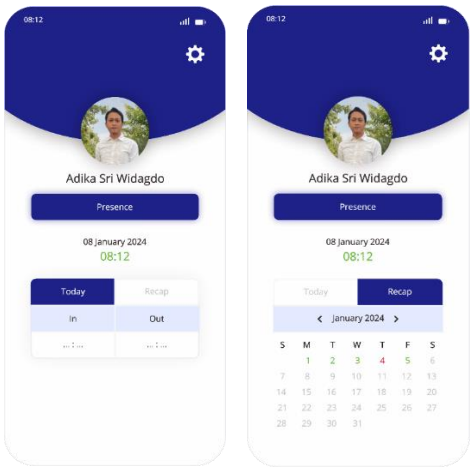

Figure 9 Dashboard Page Prototype

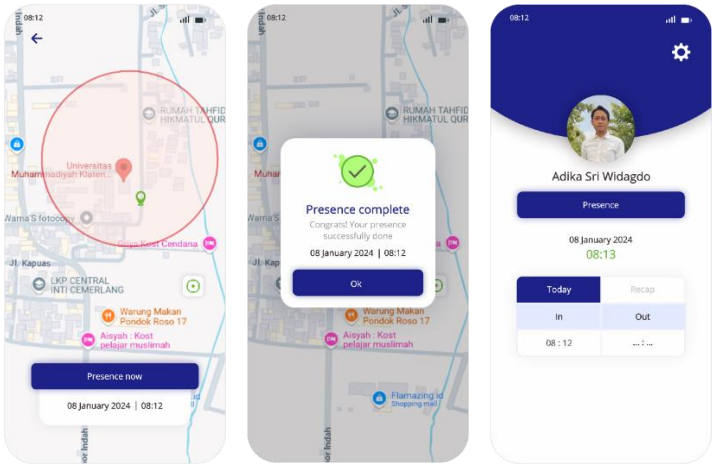

Figure 10 Prototype of Presence Process and Dashboard Page After Presence Process

TESTING

Task usability testing using the Maze Design application with 6 tasks and using 6 measurement scales with 5 potential users.

Table 2 Usability Test

No	Halaman	Task
P1	Register - Login	Users complete the registration flow to create a new account, then log in to the application.
P2	Today's Attendance Information	Find out the time and date information on the app
P3	Monthly Presence Recap Information	View attendance recap information per month
P4	Sync Location Process	Synchronize location at the moment before presence
P5	Presence Process	Click on the Presence now button for the attendance process
P6	Presence Confirmation	Confirm attendance if the attendance process has been completed

Table 3 Usability Test Measurement Scale

SUS Score	Grade	Adjective Rating
86% - 100%	A	Excellent
75 - 85,99%	B	Good
65 - 74,99%	C	Okay
55 - 64,99%	D	Poor
50 - 54,99%	E	Bad
< 49,99%	F	Awful

RESULTS AND DISCUSSION

Usability test that has been carried out, the results of the number of miss clicks can be seen in table 4 Number of Miss Clicks per task.

Table 4 Number of Miss Clicks per Task

Responden	Task						Jumlah Miss Clik per Responden
	P1	P2	P3	P4	P5	P6	
R1	0	0	1	2	0	0	3
R2	0	0	0	1	0	0	1
R3	0	0	1	2	0	0	3
R4	0	0	2	2	0	0	4
R5	0	0	1	2	0	0	3
Miss Clicks per Task	0	0	5	9	0	0	**14**

a : Number of missed clicks

b : Total right click opportunities

c : Miss Click Percentage

$$c = \frac{(b-a)}{b}\ x\ 100$$

There are 2 opportunities for respondents to click on a task, with the number of respondents being 5, then there are 6 tasks, so there are a total of 60 click opportunities for all tasks, all respondents.

$$c = \frac{(14-60)}{60}\ x\ 100$$

$$c = \frac{46}{60}\ x\ 100$$

$$c = 0{,}766\ x\ 100$$
$$c = 76{,}6\%$$

The test results showed that the design received a usability test score of 76.6% in the Good category and provided several recommendations for improving the mobile presence appearance of the respondents and for further research, namely:

1. There is a forgot password feature
2. Adding respondents for prototype trials in usability testing to get maximum results
3. Color-differentiated presence button
4. Prototype design is made into an application at the front-end stage.

This study concludes that the UI/UX design of the mobile attendance application prototype with the Design Thinking method is effective in overcoming the problem of manual attendance at the Universitas Muhammadiyah Klaten. This process includes identifying user needs to developing solutions. Usability testing with the System Usability Scale (SUS) showed good acceptance with a score in the "Good" category. Users rated the app as efficient and easy to use, with suggestions for the development of additional features. Overall, the app offers a more practical presence solution and is recommended to be further developed with more complete features and more extensive testing.

CONCLUSION

This study successfully designed a UI/UX prototype for a mobile-based employee presence application at Universitas Muhammadiyah Klaten using the Design Thinking approach. The prototype was developed through five stages: Empathize, Define, Ideate, Prototype, and Test. Usability testing using the System Usability Scale (SUS) resulted in a score of 76.6%, indicating a "Good" level of usability. The findings demonstrate that the proposed design effectively addresses the inefficiencies of manual presence systems, improving user experience and operational efficiency.

Several recommendations for future improvements were identified, including adding a "forgot password" feature, differentiating the presence button color for better usability, and expanding usability testing with a larger respondent base. Additionally, the transition from prototype to a fully functional application at the front-end development stage is suggested to enhance its practical implementation.

Overall, this research highlights the significance of a user-centered approach in designing digital presence solutions. By addressing user needs and optimizing usability, the proposed application can contribute to a more efficient and seamless presence management system. Future studies could explore additional features and conduct broader testing to refine the application further.

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