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UI/UX Design on Prototype Attendance Using the Design Thinking Method

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ABSTRACT

Presence is a data collection activity to determine the number of attendance. Presence is a process of activities that is often carried out even every day by many corporate agencies or schools and colleges. One of the institutions that use presence is a school. Several schools have implemented attendance systems. But there are a number of schools that still apply manual attendance where employees or teachers must sign the attendance sheet, one of which is SMK Mpu Tantular Kemranjen which still applies attendance manually. Obstacles experienced from using manual attendance are that there is often a mismatch between attendance by teachers and staff employees in the field with notes made in the TU section and sometimes there are teachers and staff employees who leave absences. Therefore it is necessary to make a UI/UX design design for the attendance application that is appropriate for the attendance process for teachers and staff employees at SMK Mpu Tantular Kemranjen. This study uses the Design Thinking method with 5 stages, namely Emphatize, Define, Ideate, Prototype, and Test. The results of this study are in the form of a UI/UX prototype design for presence applications that suit user needs.

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INTRODUCTION

Presence is a data collection activity to determine the number of attendance at an event. Presence is a process of activities that is often carried out even every day by many corporate agencies or schools and colleges [1]. The presence process is not only carried out in a company agency but can also be carried out at an event or activity. Presence can provide information for an activity regarding participants [2].

Attendance is often done in two ways, namely manually and systemically [3]. Manual attendance requires participants or the organizers to record the attendance list of participants on the paper or sheets provided [4]. While the system requires participants or organizers to record the attendance list of participants in the system[5]. The drawback of manual attendance is that the recorded data still has the possibility to change at any time due to the actions of other participants or the negligence of the organizers [6]. Meanwhile, the advantage of Presence in the system is that Presence is clearly recorded and nothing can change it except the system holder [7].

In making UI designs there are several models that can be applied and used. The Design Thinking method is used for the process of making UI designs [8]. The Design Thinking method is an approach to the design process that offers solutions in solving a problem by making decisions that will generate new and innovative ideas[9].

The use of the Design Thinking method can affect the UI and UX processes of a product[10]. The Design Thinking method has several processes such as Empathize, Define, Ideate, Prototype and Test[11]. Each process aims to find solutions to user problems and then find solutions[12]. So in this method the role of the user is very important because later the design results will be used by the user. Design Thinking is used as a new method in the design process[13].

User Interface and User Experience are two important things used in designing an application. User Interface (UI) is when the system and users can interact with each other through commands such as using content and entering data. Meanwhile, User Experience (UX) is defined as user experience related to reactions, perceptions, behavior, emotions, and thoughts of users when using the system[14].

Application development using Design Thinking can be used to create User Interface and User Experience designs that accommodate user needs. The application of methods starting from the Emphatize, Define, Ideate, Prototype, and Test processes in the case study of creating the UI/UX of the M-Voting application at the IST AKPRIND Informatics Engineering Student Association resulted in a prototype final product that had gone through the direct testing process by the user and system testing using component testing on the menu component has led to the right page and testing of the application button has also run according to its function[15]. Other tests with integration testing related to the CRUD (Create, Read, Update, Delete) process and system validation have also gone well[16][3].

One agency that uses attendance is the School. Several schools have implemented attendance systems. But there are a number of schools that still apply manual attendance where employees or teachers must sign the attendance sheet, one of which is SMK Mpu Tantular Kemranjen. The manual implementation of Presence still applies to teachers, staff, and students. This presence serves as a record of teacher and employee attendance which will be recorded by TU every five times a week for a month. This attendance record

aims to find out how many times the teacher and employee staff are present and will be used to calculate Honor (HR).

METHOD

Making this UI design made for the mobile application platform. The software used is Figma. In the next stage, namely creating a UI wireframe design using the Design Thinking method, the researcher created a wireframe display (sketch) of the presence application. Furthermore, after completing the wireframe, the design will be analyzed whether it can be used or not, then after the design has been analyzed and can be used, then continue implementing the design into the finished application display form. In the last stage the researcher wrote the report.

Design thinking is divided into 5 stages as follows:

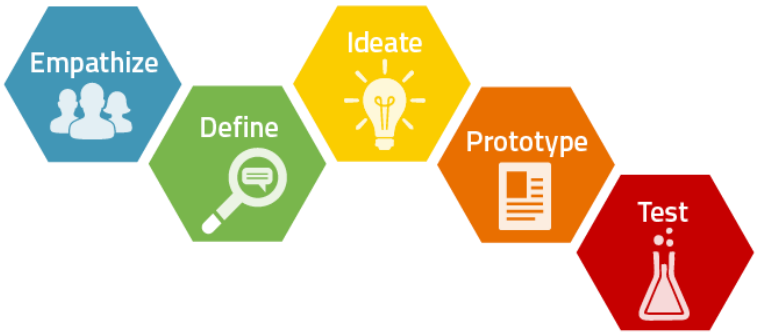

Figure 1, Stages of Design Thinking

The Empathize process is the process of carrying out activities to find out user needs by conducting interviews and observing user needs.

Define is analyzing and understanding the results that have been done in the Emphatize process. This process aims to describe the user's ideas or views as the basis for the application product to be made. Make a list of user needs.

Ideate merupakan proses transisi dari rumusan masalah menuju penyelesaian masalah, adapun dalam proses *ideate* ini akan berkonsentrasi untuk menghasilkan gagasan atau ide sebagai landasan dalam membuat *prototype* perancangan yang akan dibuat.

The Prototype process is the process of implementing ideas that have been obtained from the previous stages into an application and product that can be tested. This stage produces finished products and application usage scenarios.

Test (trial) or testing is carried out to collect various user feedback from various final designs that have been formulated in the previous prototype process. The system testing process is carried out by conducting Component testing, namely testing the system components using a questionnaire. The component tested in this study is the interface component. Component testing is carried out with the aim of knowing whether the interface functionality that has been made functions as expected or not.

This project ended with producing a Prototype Mobile Presence Application version of the UI and UX results. Prototypes are made for the purpose of demonstration or making a presence application design. In prototyping, a design tool is used, namely Figma. Figma is a design tool that is usually used to create mobile, desktop, website and other applications. Figma is commonly used on Windows, Linux or macOS operating systems connected to the internet. Figma is widely used by someone who works in UI/UX, web design and other similar fields.

RESULT & DISCUSSION

The Empathize process is the stage where an approach is made to the user to get information and find out what the user wants. In this process, observations and interviews are carried out to determine the needs of users. In this process, observations were made by directly observing how the presence process was at SMK Mpu Tantular. Then an interview was conducted with the Principal of SMK Mpu Tantular regarding the attendance process. An interview session with the Principal was conducted to strengthen the need for an E-Presence application that fits the needs of the school. Table 1 below contains several interview questions related to attendance applications.

Table 1, Draft question for responden.

No.	List of Interview Questions
1	In what way is the presence process carried out?
2	Who is involved in the presence process?
3	Is it necessary to develop an Android application to facilitate teachers and employee staff to take attendance?
4	Does this problem have to be solved by making an android application?
5	How much do teachers and employee staff need to use the E-Presence mobile application to take attendance?
6	Are teachers and staff employees ready to use this application if the application is available?

The Define process is the process of getting ideas or user views to become the basis for the application product to be made. After conducting interviews at the empathize stage, the results obtained were user needs for the E-Presence application. Table 2 is a list of user needs for the E-Presence application.

Table 2, User Requirements List

No.	List of User Requirements
1	Applications are Realtime
2	Users must meet the requirements, namely teachers and staff of SMK Mpu Tantular employees
3	Can be used anywhere
4	The attendance process can only be done at a predetermined time
5	The application can be accessed using a smartphone
6	Each user's personal data is confidential

At the Ideate stage, several solution ideas are collected based on the needs of the users. A collection of these solution ideas is used as input to determine which ones will be

implemented in the form of user interface designs. The solution idea that is implemented into a user interface can be seen in Figure 2. In the explanation in Figure 2 below, to facilitate the design, the model uses Indonesian to make the prototype.

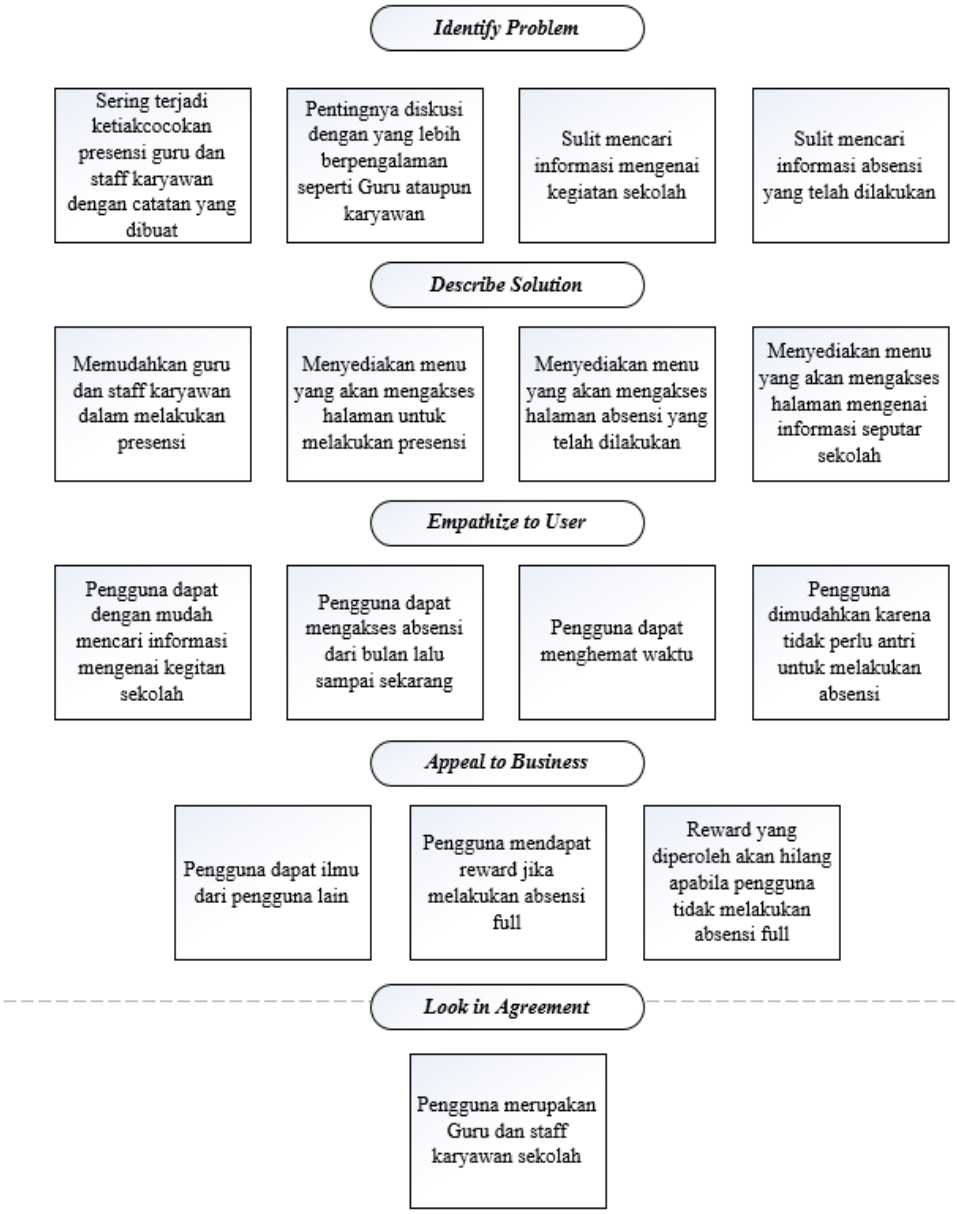

Figure 2, Presence Application Ideate Design

Based on Figure 2, it will be formed into a wireframe which aims as a guide in designing the UI/UX that will be made in prototyping.

Prototype is the process of implementing ideas that have been obtained from the previous stages into applications and products that can be tested. This stage produces finished products and application usage scenarios. Some of the application views can be seen in the image below.

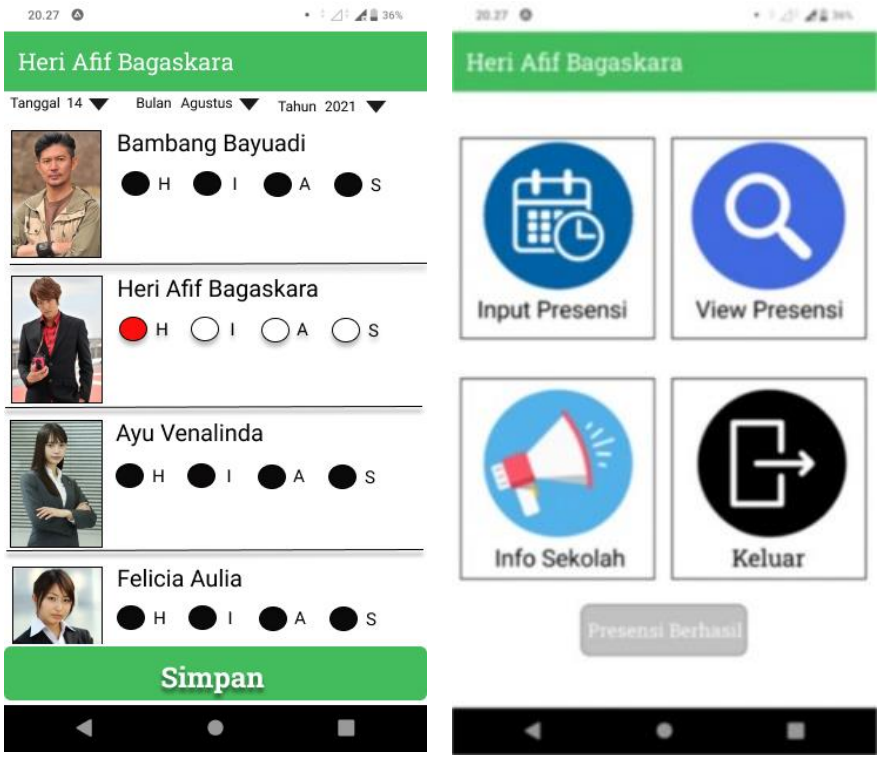

Figure 3, Sample design UI/UX on prototyping application

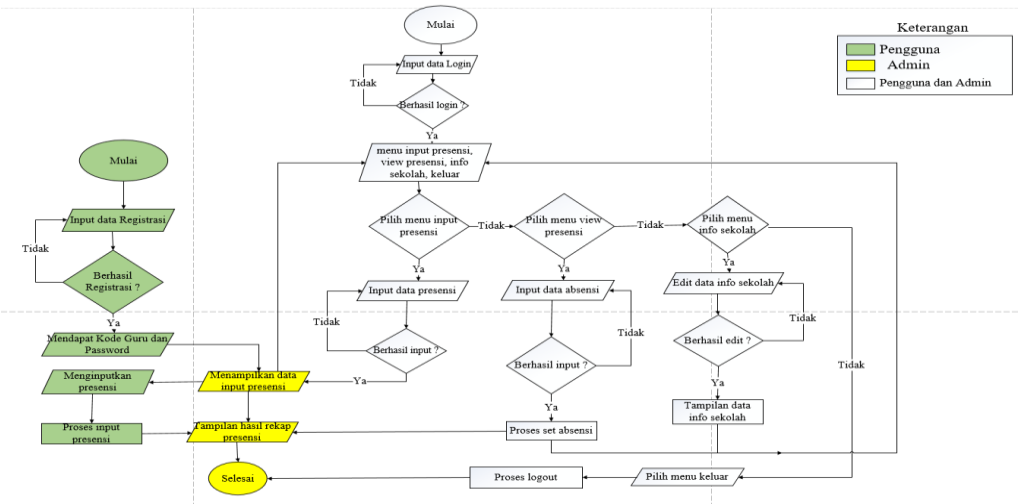

Figure 4, Scenario System Function

Tests or tests are carried out to collect various user feedback from various final designs that have been formulated in the previous prototype process. The system testing process is carried out by conducting Component testing, namely testing the system components. The components tested in this study are the interface components in the design. Testing of the attendance application design involved 21 respondents by filling out the distributed questionnaires.

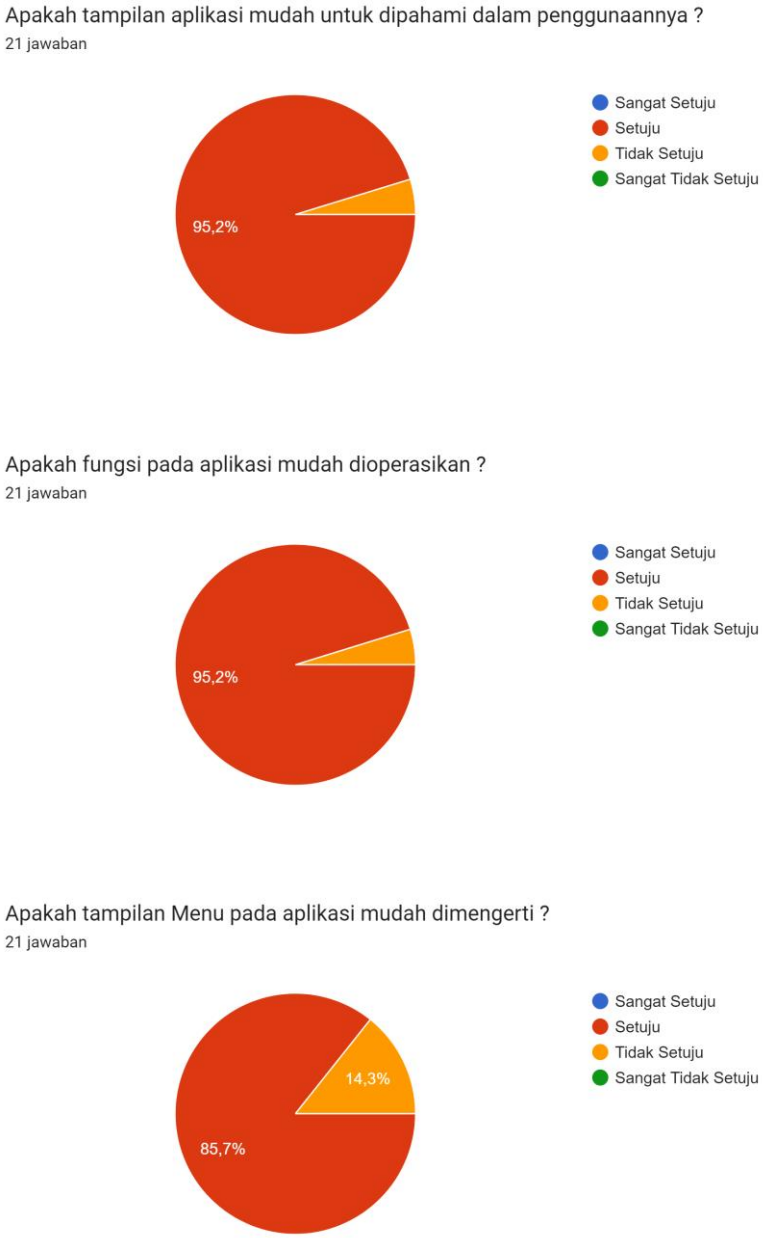

Figure 5, Result of Testing Analysis.

In Figure 5, the results of filling out a questionnaire regarding the design of the presence application get 95.2% results for the overall appearance of the application, 95.2% for functions in the application, and 85.7% for display on each menu, from these results it is stated that the interface design the application is easy to understand in use and all menu components and buttons in the application have led to the right page and have run according to their function.

CONCLUTIONS

Application design using Design Thinking can be used to create a User Interface (interface) and User Experience (user experience design) that meet user needs. The application of methods starting from the Emphatize, Define, Ideate, Prototype, and Test processes in the case studies of User Interface (UI) Design and User Experience (UX) Prototype of the E-Presence application at SMK Mpu Tantular really helps system development to produce product prototypes that are in accordance with user expectations. The final result obtained is in the form of a UI/UX prototype design for presence applications that suit user needs. From filling out a questionnaire regarding the design of the presence application, the result was 95.2% for the overall appearance of the application, 95.2% for the functions of the application, and 85.7% for the display on each menu, the results stated that the application interface design was easy to understand in its use and all menu components and buttons in the application have led to the right page and have run according to their function.

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