ATTENDANCE SYSTEM DEVELOPMENT SUPPORT IN DIVISION MEMBERS PERFORMANCE ASSESSMENT CODELABS UNIKOM

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ABSTRACT

Attendance is a major factor in an agency or company in achieving its objectives, it relates to the discipline and good impact on the poor management of human resources or the quality isntansi itself, the impact of which can mean a lack of output for that agency. Therefore, the need for data collection specific to an mencatan presence of members. Many ways are used to manage kehadira one of them is using a fingerprint, but the system requires a significant financial cost in terms of the manufacture, maintenance and others. But attendance using fingerprints terjadim validity for each individual human beings have different fingerprints and can not be removed. In a instanti or organinasi needed a way of performance appraisal is useful for determining the peformance of the organization's members. CodeLabs division itself using a system called KPI (Key Performance Indicato) designed by each kementiran CodeLabs. This KPI has several major kompone among others: research, competition, operational, and business pudbok. For the construction of this system uses three methods of domain analysis of cases, implementation of the system and the implementation of IOT.

Keywords: Attendance, Fingerprint, Performance Assessment, KPI (Key Peformance Indicators), CodeLabs

1 PRELIMINARY

The performance assessment is a measurement that is mutually agree to judge a person in the course of his employment[1], Activities of the organization in terms of research performance can improve organizational decisions and provide feedback to members on the exercise of their duties or employment[2],

CodeLabs is one of the divisions that exist in the University Computer Indonesia engaged in the pemgembangan software. CodeLabs engaged in the development of mobile applications, Web, IOT, AR / VR, UI / UX and Games. In addition to the competition CodeLabs was tasked to assist pemgembangan applications in the academic environment of the University Computer Indonesia. Some examples of products that have been built are: Sellution, Comrade, Land Airuku, Dodo, Tapto, and so on. In an organization needed a way of performance appraisal is useful for determining the peformance of the organization's members. CodeLabs division itself using a system called KPI (Key Performance Indicator) designed by each ministry CodeLabs. This KPI has several main components include Research, Competition, Operations, and Business Pudbok.

Attendance process that is done today is only the presence of internal meetings and activities are included in the sub-components of the KPI and for attendance at CodeLabs still more to personal responsibility among members of the builder / chairman CodeLabs division. As for the division key CodeLabs have only 2 room keys kept by members who used to come in the morning and the last return, when coming late morning the others must find room key to office boy / girl. This leads to members of the late start of activities and affect the assessment of the components of the KPI. With these problems the author tries to give a solution with an attendance fingerprint attendance system and also as a replacement for the key in order to facilitate the access door.

2 LITERATURE REVIEW

2.1 Based Biometric Fingerprint Identification

Biometric comes from the Greek bios meaning life and metron meaning measure. Biometric is a method for recognizing humans based upon one or more characteristics or behaviors that are unique. Advantages of using biometrics that can not be forged or misused, can not be lost or forgotten, it is difficult in duplication, shared or transferred, authenticity is guaranteed for presenting people as a validation tool[3],

Characteristic of biometrics are:

- *Physiological* associated with the shape of the body, such as fingerprint, face recognition, and iris recognition geometric hand.
- *behavior* associated with the behavior, such as keystroke, signature and voice[3],

1. **Fingerprint**
Genetic structure is in the form of a very detailed framework and a sign attached to a human finger can not be deleted or moved. A fingerprint with a more detailed pattern can have up to nineteen different types of minutia. In general fingerprint has only two types namely Ridge endings and bifurcation[4],

2. **Qualities Fingerprint**
The security system using fingerprints have been proven to be quite accurate, safe, easy and convenient to use as identification. Can be seen on the properties owned by fingerprints following, among others:
   a) *Perennial* Nature, the streaks on the fingerprint attached to the human skin for life.
   b) *immutability*, Ie a person's fingerprints never change unless a serious accident.
   c) *individuality*, Which is unique and different for each person.[5]

3. **Basic Pattern Fingerprint**
Fingerprint patterns are always in every human fingers and permanent. Either from birth to adulthood pattern will not change, each a finger has a different fingerprint patterns. There are four basic patterns of fingerprints dermatoglyphic known that whorl, Arch, Loop and Tiradius[6],
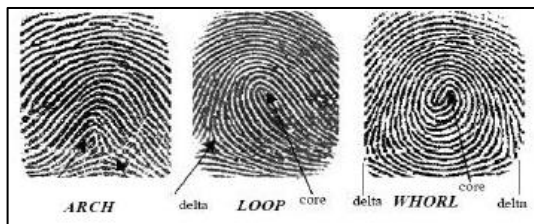
Picture 1, Type Fingerprint

2.2 Door Access Control

Is a system that can or to restrict something place or room so that only people who have access rights that can enter the area. An access control works using Fingerprint media, RFID Card, PIN, and Combination[7],

1. **FPM10A**
A fingerprint module arduino with optical fingerprint sensor, high-speed DSP processors, high-performance fingerprint matching algorithm, chip FLASH capacity Besas, other hardware and software composition. Fingerprint module performance is stable, functional, several functions: registration, matching and fingerprint search[8],

2. **Arduino Mega2560**
According to Massimo Banzi, co-founder or creator of Arduino, Arduino is an open source hardware platform that has input and output (I / O) simple[9],

3. **Arduino Ethernet Shield W5100**
*Arduino*Ethernet Shield is a link between arduino to the Internet in just minutes, simply plug the module into arduino board, connect to a network with an RJ45 cable and follow some simple instructions to get started on the Internet. Ethernet Shield is based on Wiznet W5100 ethernet chip (datasheet). Wiznet W5100 provides IP network stack that can be used either TCP / UDP[10],

2.3 Object Oriented Programming (OOP)

Driven programming object or an suatau oop programming approach that uses objects and classes. Currently oop is growing. Almost all programmers and application developers applying OOP concepts. Oop is not just a way of writing syntax, but more than that, a loop is a perspective in analyzing systems and programming problems[11],

1. **PHP**
PHP (Hypertext Preprocessor) is a programming language that is used to handling, manufacture and development of a website and it can be used in conjunction with HTML. According to Arief, PHP is the language of the server-side scripting that integrates with HTML to create dynamic web pages. Because PHP is a server-side-scripting eat syntax and commands to be executed on the server PHP and the results will be sent to the browser with HTML format[12],

2. **UML (Unified Modeling Language)**
Is a language to specify, visualize, construction and documenting the artifacts of software systems. As in business modeling and other non-system software.[13]
   Diagram-diagrams, among others:
   1) Diagram usecase
   Describe the functionality expected of a system. The emphasis is "what" is done the system, and not the "how". Usecase represents an interaction between actors crimped system[14],
   2) Class Diagram
   Is a specification that if diintansikan will generate an object and is the core of object-oriented development and Desai[14],
   3) sequence Diagram
   Used to track the execution of a scenario usecase[14], Sequence diagam portrait of interaction with each participation mark with a life line that runs vertical down and the order of messages by reading down the page direction.

4) Activity Diagram
   Provides a visual representation of the flow of activities, both in the system, business, workflow, or other processes[14],

2.4 database
According to Bambang Harianto is kumpulam database-related data. Relationships between data can be indicated by a sign field key column of each file / table that is[15],

3 Research methods
The research method for the construction of this system uses three methods of domain analysis case, the method of construction of the system, and method of IOT development that will be presented as follows:
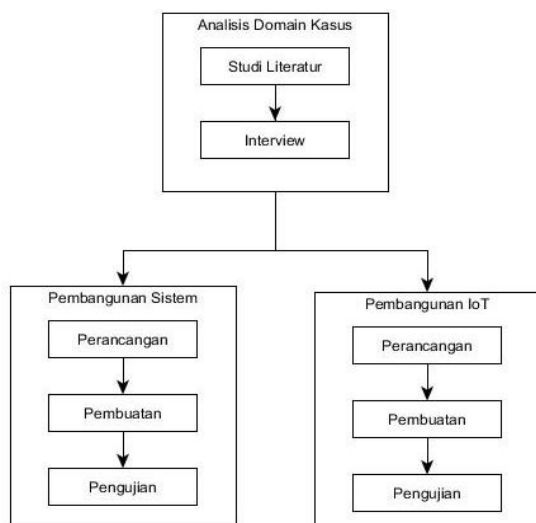
Picture 2, Research methods

3.1 Domain analysis case
a) Study of literature
   The data collection is done is by studying, researching and taking references from many previous studies related to the topics covered in this study, as well as finding more efficient sensors used in systems with establishment.
b) interview
   Penggumpulan techniques of data by conducting a question and answer directly to the president CodeLabs division members related to the topics covered.

3.2 development System
a) Design
   Is a phase that apply theories learned so arranged a system design to software.
b) manufacture
   Is an advanced stage, which is where at this stage the authors are working on the software that has been designed in the previous stage.

c) examination
   It is a method to find out the results of the software design is made whether it is in accordance with the desired.

3.3 IOT development
a) Design
   Is a phase that apply theories learned so arranged a system design to hardware.
b) manufacture
   Is an advanced stage, which is where at this stage the authors are working on the hardware that has been designed in the previous stage.
c) examination
   It is a method to find out the results of the design software created if it is within their desirable.

4 Results and Discussion
4.1 Problem analysis
Analysis of the problem which is attached at this time dalah CodeLabs division as follows

1) The absence of the assessment process related to daily attendance division members CodeLabs
2) CodeLavs other members not had access spatial CodeLabs when it comes ahead of the own keys.

4.2 Analysis System Running
Analysis of the current system is tahapn which aims to provide a more detailed picture of how the current system is.

Procedure presence of members CodeLabs

- CodeLabs member came into the room CodeLabs 9 o'clock.
- CodeLabs members walked into the room and engage in activities that included into the main kompone KPI.
- CodeLabs members who perform activities related to IBC will be considered present.
- If members are not present CodeLabs maximum of 3 it will be reprimanded by the head of the division CodeLabs.

Access procedure room CodeLabs

- CodeLabs member came into the room CodeLabs.
- Until the member CodeLabs diruangan check whether the room is already open.
- If the room is not open then had to ask for a key to the office boy / girl or waiting for members who hold the key to come and open the room.
- If the room is already open then it can go in and start activities that are included into the main component of the KPI.
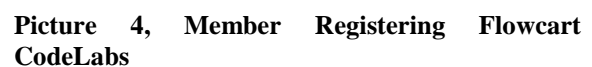
4.3 System Architecture

In this section the author explains how the flow of the system will be built.

Picture 3, System Architecture

Here is an explanation of Figure 3 above:
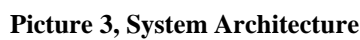
1. CodeLabs division members who come will perform the scan fingerprint presence.
2. *FingerScanner* will automatically read and identify with ladies fingerprint saved, then sends the data in the form of fingerprint id to Arduino Mega2560.
3. After Mega2560 Arduino Arduino obtain fingerprint id Mega2560 will determine nim who has id's fingerprints and forward it to the Arduino Ethernet Shield W5100 in order to be saved.
4. Nim fed when registering fingerprint.
5. Then Arduino Mega2560 will give the order to open access CodeLabs room, displays a message to the lcd and sent to the web service via Ardiuno Shield Etherned W5100.
6. Web Operations entered into the system through a web based browser available that is connected to the internet.
7. *web* service will process the request to access the data in the database, and then the data will be displayed to the browser.

4.4 analysis Fingerprint

Is a chart that shows the workflow or what sedabg done within the overall system and explain the sequence of procedures that exist within the system.

1. Registering member CodeLas
   A workflow or procedures when registering CodeLabs members.

Picture 4, Member Registering Flowcart CodeLabs

2. Member Attendance And Access Room CodeLabs CodeLabs
   A workflow or procedures when doing hariang member CodeLabs attendance and to access CodeLabs room.

Picture 5, Members Daily Attendance Flowchart CodeLabs

4.5 Diagram usecase

Usecase is a diagram showing the functionality of a system or class and how the system interacts with the outside world proficiency level and explain the functional system that looks user.
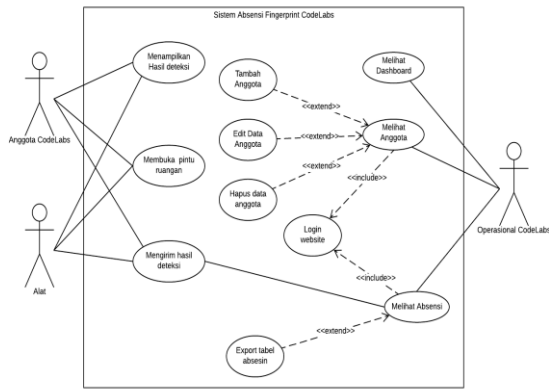
Picture 6, Attendance Diagram Based CodeLabs Usecase IOT

4.6 Class Diagram

Class diagram is a diagram that models a set of classes, interfaces and relationships. Class diagrams depicted with a box which is basically divided into three parts: class name, attributes, and operations.
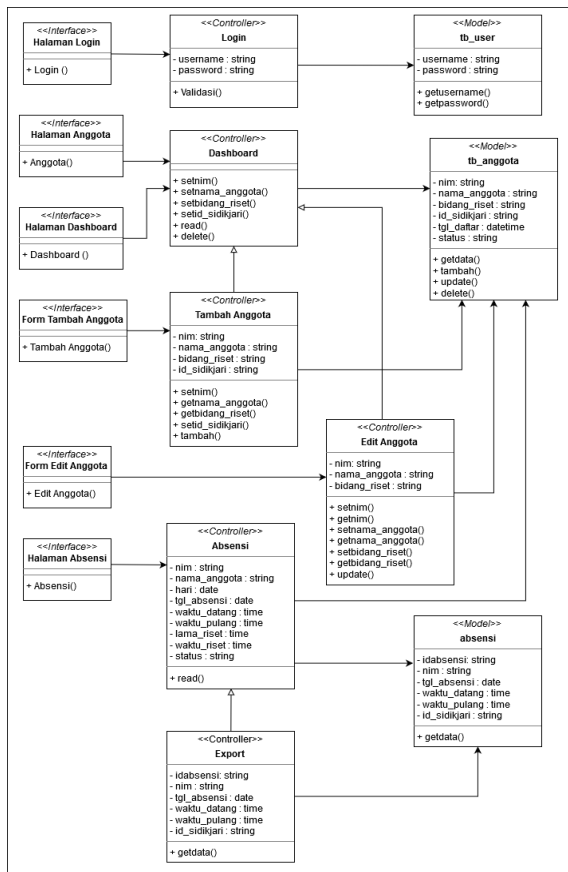
Picture 7, Class Diagram

4.7 Relation scheme

Relationship scheme is a series connection between a few tables in the database system. Can be seen in the picture below.
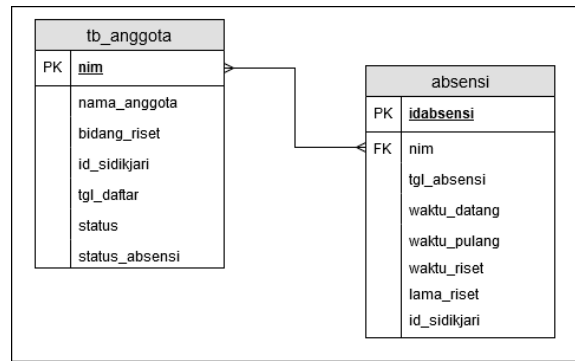
Picture 8, Relation scheme

4.8 System implementation

At this stage, will do inplementasi system of design have made in the previous chapter. The stages are hardware implementation, software implementation and interface implementation.

1. Hardware implementation

In this section shows the implementation of the tools that have been made into a single unit of a hardware. Can be seen in the following figure.

Picture 9, Hardware Implementation

2. Software Implementation

Software implementation specification describes the software used to implement the system.

Table 1, Tables Software Implementation

No.	Software	Information
1	Operating system	Windows 10 Pro
2	IDE (Integrated Development Environment)	Arduino IDE
		Sumblime Text 3
3	modeling	Yed Graph Editor
		Online Draw.io
		Online Lucidchart
4	Software Support	Xampp
		Browsers: Mozilla Firefox, Google Chrome and Microsoft Edge

3. implementation interface

Implementation of interface describes the interface of the website CodeLabs attendance.

a) Login to see Website
An implementation of the login view which has been designed at the design stage.
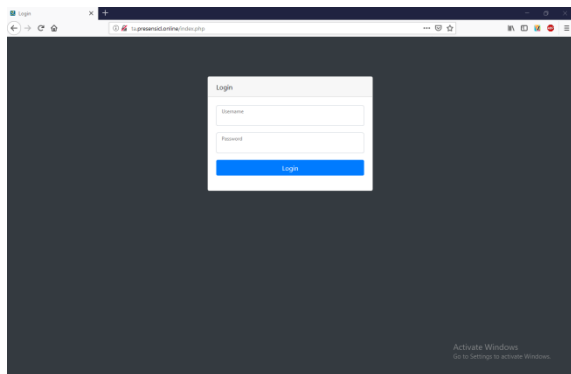
Picture 10, Implementation Interface Login

b) Dashboard display
An implementation of a dashboard display that has been designed at the design stage.
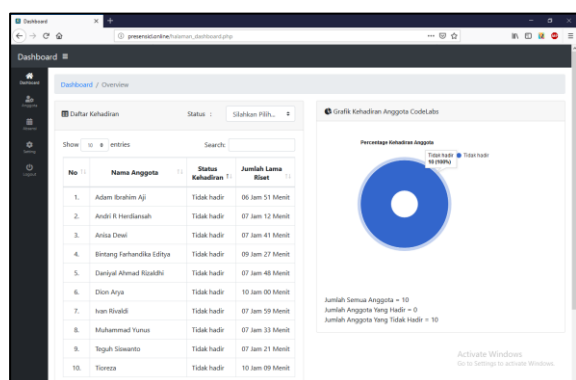
Picture 11, Implementation of Interface Dashboard

c) Members display
An implementation of the display member that has been designed at the design stage.

Picture 12, Member Interface Implementation

d) Display Form Add Member
An implementation-added display member that has been designed at the design stage.

Picture 13, Interface Implementation Form Add Member

e) Display Form Edit Members
Is an implementation of the edit view members that have been designed at the design stage.

Picture 14, Interface Implementation Form Edit Members

f) Attendance display
An implementation of the views of absenteeism has been designed at the design stage.

Picture 15, Attendance Interface Implementation

4.9 Testing the Hardware

Hardware testing is a stage to test whether the hardware is built in conformity with designed in the previous stage, in this case the testing is done with 2 stages include:

1. Member Registering testing CodeLabs
   Testing enrolled member CodeLabs an initial stage for storing data CodeLabs members either on the tool or on the website, CodeLabs member registration is done through the following phases.

Table 2, Member Registering testing CodeLabs

The initial view of the LCD on the Tools	
Display menu on the tool, type 1 on the keypad to register a new fingerprint, then mucncul tapilan as below	
The display for registering a new fingerprint, at the time of this view appears then CodeLabs members will detect fingerprints	
A display to verify the new fingerprint CodeLabs members are the same as the previous stage or not	

See id fingerprint to be registered and pengimputan nim of the keypad after that type "D" to enter and store data member CodeLabs	

In the table above can be seen that the system successfully adds CodeLabs member data and transmit fingerprint id nim and the yard to add data members in attendance website. It can be concluded that the test member CodeLabs successfully registering the data as required.

2. testing Attendance
   Testing CodeLabs member attendance is a stage for storing attendance data CodeLabs members in attendance page of the website. The absence of testing done in several stages can be seen as follows.

Table3, testing Attendance

The initial view of the LCD on the Tools	
Put fingerprint on fingescanner if the fingerprint is registered it will display to the LCD id finger, and a member CodeLabs, then also will appear attendance message successfully	
Whereas if meleetakkan fingerprints on fingescanner and fingerprint are registered, but the connection is interrupted so that the attendance data can not be sent then, would appear to LCD id finger and will also appear attendance message failed	

LCD display when it detects a fingerprint that has been registered on the tool	

In the table above can be seen that the attendance device successfully identify fingerprints registered, send a registered fingerprint attendance data, and displays an error message if there is a connection. Based on the above table it can be concluded that the attendance system has been running in accordance with the needs

5 Conclusion

5.1 Conclusion

Based on the implementation and testing of software and hardware that is built gotten some conclusions, among others: the implemented system can support performance assessment activities related to the presence CodeLabs division members members, and implemented systems that can make it easier to access the room CodeLabs division.

5.2 Suggestion

Here are suggestions for the development of the attendance system development support member in the performance appraisal CodeLabs division WELCOME: Extra-time details on the tools in order to know the time when doing attendance, and accuracy in fingerprint detection is further enhanced for safety and comfort.

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