

Design and development of a web-based compensation information and registration system using biometric fingerprint approval delivery using telegram bot digital

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Abstract— Compensation is an activity carried out by students outside class hours as a sanction for the student's absence from attending scheduled lectures. In this era, information is really needed, especially information on compensation in lectures. Initially compensation on digital telecommunications networks was still done manually or by coming directly to the admin to ask about compensation. But after this system is created, it will improve the compensation system on digital telecommunications networks. Students only need to access the website and no longer need to come to campus to find out information about compensation. The website has been designed in such a way to make things easier for students. This system is very useful for students because all compensation matters can be done via the website so it will be more effective for students. The problem with the Digital Telecommunication Network Study Program is that 84% of students have not compensated and only 16% of students have compensated. Based on these problems, development was carried out in the form of designing a web-based compensation information and registration system using biometric fingerprints for sending compensation agreements using a telegram bot. The information system used is a series of biometric systems with fingerprint sensor devices with FPM10A module, Telegram Bot, Arduino and ESP32 features and produces a system prototype that can provide information about compensation and compensation registration to polynema students so that it can make things easier for students of the Digital Telecommunication Network Study Program Malang State Polytechnic in paying compensation.

Keywords— Compensation Website, Design, ESP32, FPM10A Module, Telegram.

I. INTRODUCTION

The attendance system is one of the main things, especially in an attendance. Student attendance has developed various kinds of tools or technologies that have been found and used, for example attendance using attendance cards, using face and fingerprint recognition [1]. Universities need an attendance system that can improve the quality of discipline for the students themselves. Using an online attendance system can give a more luxurious and more efficient impression compared to using a manual attendance system [2].

Currently, attendance needs are still done manually. In appearance, you can only see manually the compensation data through the study program admin. While this compensation must be done especially for students who have a large number of absenteeism in one semester. From study program admin data obtained in the odd 2021-2022 school year, even 2021-2022, and odd 2022-2023, there were as many as 84% who had not made compensation so compensation points had not been paid off and only 16% of students had paid compensation. Compensation is usually done per semester or if there is work by coming to the study program admin then asking about work to pay off compensation. Therefore, the aim of this research is to create an information system for students to pay compensation points by utilizing fingerprint biometrics with

the FPM10A module. Students can attach fingerprint biometrics with the FPM10A module that has been registered in the database to fulfill the attendance and return list as proof that students have carried out compensation activities with the addition of Arduino ESP32 and copy the link connected to the web for registration of compensation work then connect to telegram as a notification notification that students can compensate. And produce a prototype system that aims for students in managing compensation points.

Arduino is an application for programming (coding) through this software Arduino / NodeMCU is programmed to perform embedded functions through programming syntax [3]. Arduino has its own advantages compared to other microcontroller boards besides being open source, Arduino also has its own programming language in the form of C language [4]. C language is a programming language that places itself in the middle between low-level and high-level languages using assembly commands [3].

ESP32 is a microcontroller introduced by Espressif System which is the successor of the ESP8266 microcontroller [3]. ESP32 is equipped with features such as Bluetooth and WiFi [5]. ESP32 has specifications as shown below [6]:

Voltage: 3.3 Volts

Processor: Tensilica L108 32 bit

Processor Speed: Dual 160MHz
 Ram : 520K
 GPIOs : 34

Biometric authentication in security is very important to maintain data security, but many technologies have been implemented to maintain this authentication, but there are many obstacles in its application and it still does not provide safe protection. Biometric technology offers biological authentication enabling the system to recognize users more precisely [7]. Biometrics means measuring the distinguishing characteristics of a person's body or behavior that are used to automatically identify that person's identity, by comparing it with characteristics previously stored in a database [8].

Fingerprint is one of the technological developments that has pretty good security. In simple terms, this security system will work by "recording" a person's fingerprints via the fingerprint sensor module, then storing their distinctive pattern. Identification is done by matching the data that has been stored using Arduino [9]. Before fingerprint sensors were invented, data used to be secured with a password or ID, some used patterns to secure data. But now, thanks to the discovery of security methods using patterns and passwords, they are starting to be abandoned, because they are less personal [8]. The identification process is carried out by a fingerprint sensor. The fingerprint is placed on an object or an object to be identified [10].

Telegram is an encrypted chat application that is known to be very safe and sophisticated. Qualified security features and supported by various advanced tools and features have made Telegram even more popular. Where later through the Telegram Bot feature will receive notifications related to notifications about the web [3]. Telegram is an encrypted chat application that is known to be very safe and sophisticated. Qualified security features and supported by various advanced tools and features have made Telegram even more popular. Where later through the Telegram Bot feature will receive notifications related to notifications about the web [3]. Along with the Telegram Messenger, many people are starting to install it and use it for everyday conversations. Indeed, Telegram is not as popular as Whatsapp, BBM, or Line. However, it could be that one day it will become a messenger with the potential to win hearts among the virtual community [11]. The Telegram client is available for mobile devices (Android, iOS, Windows Phone, Ubuntu Touch) and computer systems (Windows, OS X, Linux). Users can send messages and exchange photos, videos, stickers, audio, and other file types. Telegram also provides optional end-to-end encrypted messaging. The client-side code is open system software but contains binary blobs, and the source code for the latest version is not always published immediately, while the server-side code is closed source and patented [12].

PhpMyAdmin is an open source-based application or tool that can be used free of charge to do programming or administration of MySQL databases. PhpMyAdmin itself uses the PHP language for programming, besides that phpMyAdmin supports various MySQL operations, including (managing databases, tables, fields (fields), relations (relations), indexes,

users (users), permissions (permissions), and others [13]. The PHP programming language is a programming language for creating websites that are server-side scripting. PHP is dynamic. PHP can be run on various operating systems such as Windows, Linux, and Mac Os. Besides Apache, PHP also supports several other web servers, such as Microsoft ISS, Caudium, and PWS. PHP can utilize databases to produce dynamic web pages [14].

MySQL is a very popular type of database server, this is because MySQL uses SQL as the basic language to access its database. MySQL is Open Source, this software is equipped with Source code (code used to create MySQL) [15]. MySQL and PHP are considered as the ideal web application builder software couple. MySQL is more often used to build web application builder applications, generally developing applications using the script programming language PHP [16].

II. METHOD

The type of research carried out is the type of science and technology development research (IPTEK). This research develops previous research. This research discusses how to design a Web-Based Compensation Information and Registration System by Utilizing Fingerprint Biometrics and Sending Compensation Approval Using Telegram Bots, which is a tool and web creation that functions for students of Malang State Polytechnic, especially the Digital Telecommunications Network Study Program to find out information and registration of compensation through the website. This study uses the fingerprint module to input student attendance and return data as well as a website for information systems and compensation registration.

The following is a flow diagram of a Web-Based Compensation Registration and Information System. The detailed process can be seen in the flow diagram as follows:

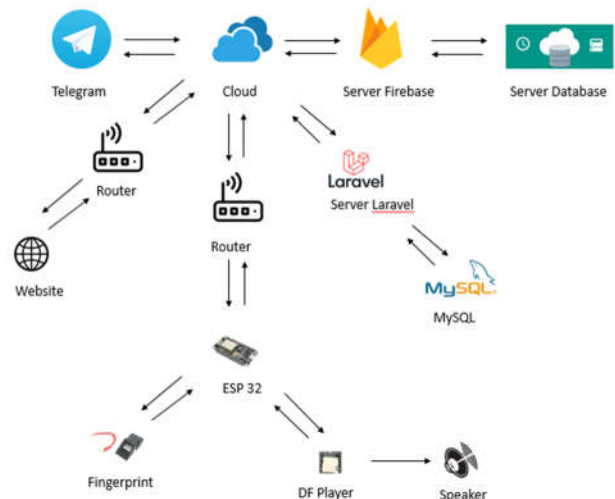


Figure 1. Flow Diagram

Fig. 1 shows that there is a main microcontroller using ESP32 which has an input component, namely a website which is used as an information system for ongoing compensation

activities. Meanwhile, the output is in the form of a fingerprint and a speaker as sound for fingerprint attendance. The information system will function as a submission of the time and compensation activities to be carried out, notification to the user's Telegram that the compensation activity has been approved, recapitulation of compensation activities that must be carried out, and uploading proof of compensation activities after the user has finished carrying out the compensation activities. The detailed process can be seen in the flowchart as follows:



Figure 2. Flowchart of The Whole System

Fig. 2 shows that to be able to access the information system, users are required to register into the system. The user will input data on the registration page, namely data on the user's name, NIM, department and study program and input

fingerprints on the biometric fingerprint. Next, log in to the web and submit a compensation registration application on the web. If it is approved by the admin, the notification tone will be approved via telegram, but if not, it will wait for an approval notification from the admin. If approved, students can make compensation, before compensating students carry out fingerprint attendance as proof that they have attended compensation and if they have finished carrying out fingerprint attendance as proof that compensation has been completed. Then check on the web, upload evidence that you have made compensation and if you have downloaded free evidence of compensation.

III. RESULTS AND DISCUSSION.

A. Research Result

In this chapter, the research results will be discussed, namely a compensation concept in the Digital Telecommunication Network Study Program at the State Polytechnic of Malang by using a website connected to telegram and fingerprint biometrics. Where the resulting concept is to register for compensation at the State Polytechnic of Malang Digital Telecommunication Network Study Program and process it digitally. In general, compensation registration still uses the manual method, namely by coming to the admin and then looking for lecturers to be able to work on compensation. This is very ineffective because you have to find and visit the admin to campus to make compensation and it is very impossible to monitor remotely. A new concept is needed to realize compensation in the Digital Telecommunication Networks Study Program, for example by creating a compensation system using a website connected to telegram and also using fingerprint biometrics. With digital data, processing and monitoring can be realized. This new concept provides many advantages, including digital registration with high accuracy and simple calibration. This design uses electronic components such as Arduino sensors and fingerprint sensors.

Arduino sensors and fingerprint sensors are components that function to detect students who have worked on compensation and as evidence for the admin. The data obtained is converted digitally through the program created. Calibration is done in the program, namely multiplying a constant. This method is a new concept used for digital data processing. Because it is done in software, it can calibrate values digitally. Besides that, the advantage of this concept is that it can handle data that can be monitored remotely. This can be done using the website that will be created. Another advantage of this concept is that the student compensation system in the Digital Telecommunication Network Study Program can be structured and students do not come offline to seek the required compensation. Students only need to open the website to be able to monitor compensation. Thus, compensation is more practical and efficient because all parameters can be monitored only by using the website. In this design, Compensation

monitoring is made with a website that can be accessed with a smartphone or PC. The website used for monitoring uses the PHP framework Laravel programming language, php my admin to display MySQL and Firebase to store and synchronize data between users in real time.



Figure 3. Results of the finished system tools

B. Data Analysis

1. Admin Account Creation Trial

In this trial carried out on the admin, if the user or admin registers an account there is a bug or not when creating an admin account. For this trial conducted by the admin. Later it will be seen when creating the account whether there is an error or not in creating the account. The results of the admin trial are shown in Fig. 4.

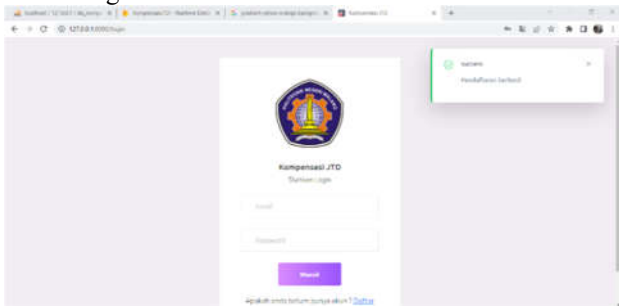


Figure 4. Testing After Successfully Creating an Admin Account

2. User Trial/User Log In (Admin)

In this trial it was carried out on the admin if the user or admin logs into the account there is a bug or not when creating the admin account. For this trial conducted by the admin. Later it will be seen whether the account login has an error or not. Admin trial results are shown in Fig. 5.

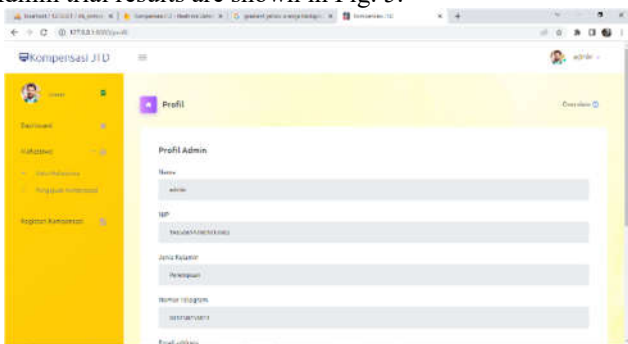


Figure 5. Testing After Successfully Login to Admin Account

3. User Trial/User Account Creation (10 Users)

In this trial carried out on users or students, if the user

registers a student account simultaneously there is a bug or not when creating student accounts simultaneously. For this trial, a sample of 10 users was used who simultaneously created student accounts on the website. Later it will be seen from the 10 users whether there is an error or not in creating the account. The results of user/user trials are shown in Table I.

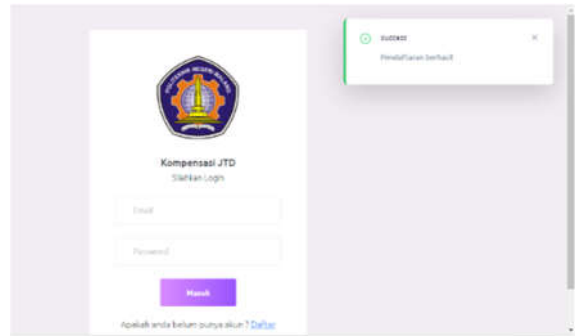


Figure 6. After Successful Account Creation

TABLE I
TRIAL OF CREATING A STUDENT ACCOUNT

No	Name	Results	Information
1.	<u>Achmad Alfa Zubri A.</u>	Successfully Create an Account	No Errors Occur
2.	<u>Refita Salsa Billa Saputri</u>	Successfully Create an Account	No Errors Occur
3.	<u>Muhammad Faroq Balitair</u>	Successfully Create an Account	No Errors Occur
4.	<u>Hendico Ade R.</u>	Successfully Create an Account	No Errors Occur
5.	<u>Amelia Feruzzi</u>	Successfully Create an Account	No Errors Occur
6.	<u>Fany Alfya Visca M.</u>	Successfully Create an Account	No Errors Occur
7.	<u>Destanuari Sufia Mukti</u>	Successfully Create an Account	No Errors Occur
8.	<u>An Netta I.W.</u>	Successfully Create an Account	No Errors Occur
9.	<u>Arif Cahyono</u>	Successfully Create an Account	No Errors Occur
10.	<u>Nur Hanafi</u>	Successfully Create an Account	No Errors Occur

4. User Trial/User Log In (10 Users)

In this trial carried out on users, if website users use the website simultaneously there is a bug or not when operating the website simultaneously. For this trial, a sample of 10 users/users operating the website was used simultaneously. Later it will be seen from the 10 users that there are errors or not in operating the website. The results of user/user trials are shown in Table II.

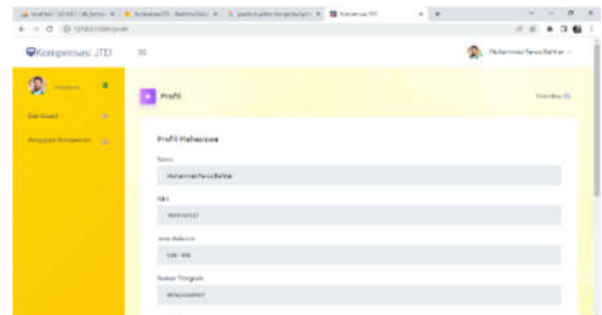


Figure 7. User After Successfully Login

TABLE II
USER LOGIN TEST

No	Name	Results	Information
1.	Achmad Alfa Zuhri A.	Login Successfully	No Errors Occur
2.	Refita Salsa Billa Saputri	Login Successfully	No Errors Occur
3.	Muhammad Farooq Bahtiar	Login Successfully	No Errors Occur
4.	Hendico Ade R.	Login Successfully	No Errors Occur
5.	Amelia Feruzzi	Login Successfully	No Errors Occur
6.	Fany Aflya Visca M.	Login Successfully	No Errors Occur
7.	Destanuari Sufia Mukti	Login Successfully	No Errors Occur
8.	An Netta I.W.	Login Successfully	No Errors Occur
9.	Arif Cahyono	Login Successfully	No Errors Occur
10.	Nur Hanafi	Login Successfully	No Errors Occur

5. Trial of Adding the Number of Student Compensation Hours by Admin

In this trial it was carried out on admins for users or students, if the website admin user does an additional number of compensation hours there is a bug or not when operating the website to increase the number of student compensation hours. For this trial the admin carried out by trying to use a sample of 10 to increase the number of hours of compensation that will be inputted on the admin website for students. Later it will be seen from 10 users or students for the addition of the number of compensation hours there is an error or not in adding the number of compensation hours on the website. The results of user/user trials are shown in Table III.

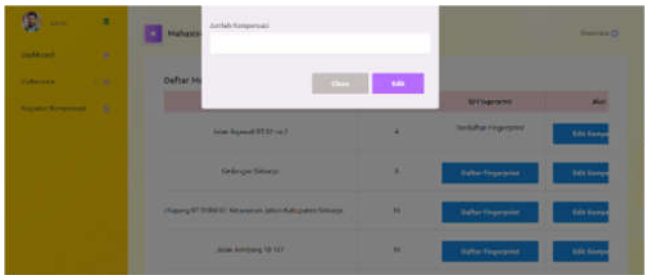


Figure 8. User Testing When Adding Compensation Hours

TABLE III

TRIAL OF ADDING THE NUMBER OF STUDENT COMPENSATION HOURS BY ADMIN

No	Name	Results	Information
1.	Achmad Alfa Zuhri A.	Successfully Performed Additional Number of Compensation Hours	No Errors Occur
2.	Refita Salsa Billa Saputri	Successfully Performed Additional Number of Compensation Hours	No Errors Occur
3.	Muhammad Farooq Bahtiar	Successfully Performed Additional Number of Compensation Hours	No Errors Occur
4.	Hendico Ade R.	Successfully Performed Additional Number of Compensation Hours	No Errors Occur
5.	Amelia Feruzzi	Successfully Performed Additional Number of Compensation Hours	No Errors Occur
6.	Fany Aflya Visca M.	Successfully Performed Additional Number of Compensation Hours	No Errors Occur
7.	Destanuari Sufia Mukti	Successfully Performed Additional Number of Compensation Hours	No Errors Occur
8.	An Netta I.W.	Successfully Performed Additional Number of Compensation Hours	No Errors Occur
9.	Arif Cahyono	Successfully Performed Additional Number of Compensation Hours	No Errors Occur
10.	Nur Hanafi	Successfully Performed Additional Number of Compensation Hours	No Errors Occur

6. Trial Edit Number of Student Compensation Hours By Admin

In this trial it was carried out on admins for users or students, if the website admin user edited the number of compensation hours there was a bug or not when operating the website to edit the number of student compensation hours. For this trial the admin carried out by trying to use a sample of 10 to edit the number of compensation hours that will be inputted on the admin website for students. Later it will be seen from 10 users or students for editing the number of compensation hours there is an error or not in editing the number of compensation hours on the website. The results of user/user trials are shown in Table IV.

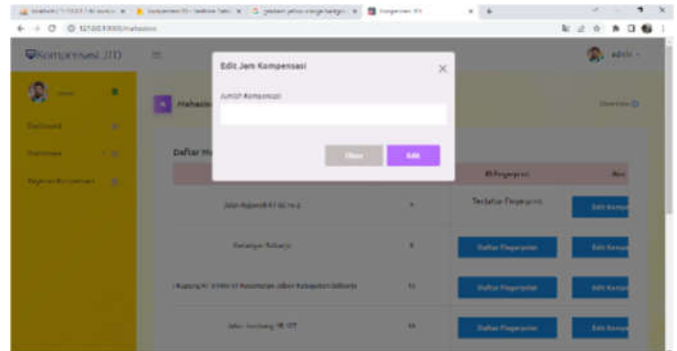


Figure 9. User Testing When Editing Total Hours of Compensation

TABLE IV

TRIAL EDITING NUMBER OF STUDENT COMPENSATION HOURS BY ADMIN

No	Name	Results	Information
1.	Achmad Alfa Zuhri A.	Successfully Edit Compensation Hours Amount	No Errors Occur
2.	Refita Salsa Billa Saputri	Successfully Edit Compensation Hours Amount	No Errors Occur
3.	Muhammad Farooq Bahtiar	Successfully Edit Compensation Hours Amount	No Errors Occur
4.	Hendico Ade R.	Successfully Edit Compensation Hours Amount	No Errors Occur
5.	Amelia Feruzzi	Successfully Edit Compensation Hours Amount	No Errors Occur
6.	Fany Aflya Visca M.	Successfully Edit Compensation Hours Amount	No Errors Occur
7.	Destanuari Sufia Mukti	Successfully Edit Compensation Hours Amount	No Errors Occur
8.	An Netta I.W.	Successfully Edit Compensation Hours Amount	No Errors Occur
9.	Arif Cahyono	Successfully Edit Compensation Hours Amount	No Errors Occur
10.	Nur Hanafi	Successfully Edit Compensation Hours Amount	No Errors Occur

7. Trial of Adding Compensation Activities to Website Admin

In this trial it was carried out on admins for users or students, if the website admin user adds compensation activities there is a bug or not when operating the website to add student compensation activities. For this trial the admin carried out by trying to use a sample of 10 compensation activities which will be inputted on the admin website for students to submit compensation simultaneously. Later it will be seen from 10 users and 10 activities for compensation that there is an error or not in adding compensation to the website. The results of user/user trials are shown in Table V.

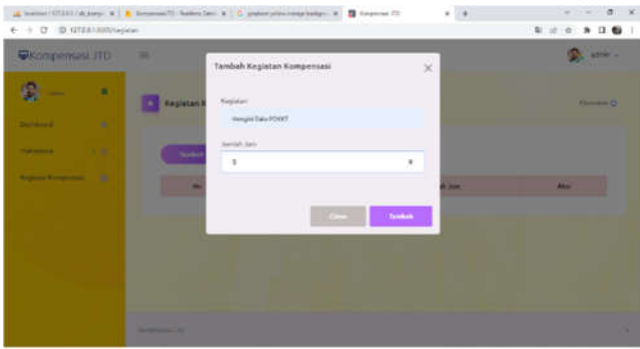


Figure 10. Admin Testing When Will Add Compensation Activities

TABLE V
TRIAL OF ADDING COMPENSATION ACTIVITIES TO WEBSITE ADMIN

No	Name	Results	Information
1.	Fill in the PDKKT Data	Successfully Performed Additional Compensation Activities	No Errors Occur
2.	Assist Sempro Registration by distributing thesis proposals to the lecturers concerned	Successfully Performed Additional Compensation Activities	No Errors Occur
3.	Tidy up Lecture Schedule Data in Admin	Successfully Performed Additional Compensation Activities	No Errors Occur
4.	Counting Test Papers and Putting in Envelopes	Successfully Performed Additional Compensation Activities	No Errors Occur
5.	Folio Stamp For Exam	Successfully Performed Additional Compensation Activities	No Errors Occur
6.	Dividing Folios for Exams (Perclass)	Successfully Performed Additional Compensation Activities	No Errors Occur
7.	Editing Journals, Translate and Arrange Sentences in Journals	Successfully Performed Additional Compensation Activities	No Errors Occur

8. Trial Submission of Compensation for Students on the Website

In this trial carried out on users or students, if the website user submits compensation simultaneously there is a bug or not when operating the website to submit student compensation. For this trial, a sample of 10 users/users applied for compensation simultaneously. Later it will be seen from the 10 users whether there is an error or not in submitting compensation on the website. The results of user/user trials are shown in Table VI.

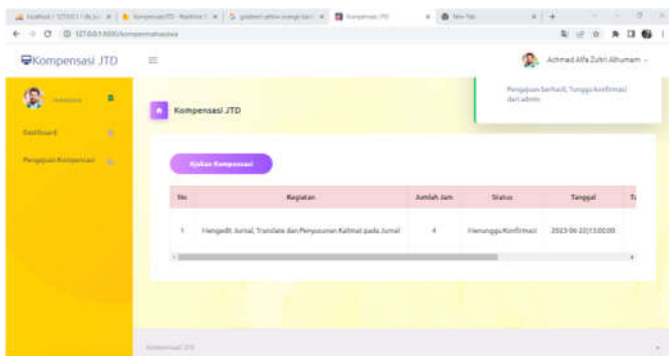


Figure 11. User or Student Testing After Successfully Submitting Compensation

TABLE VI
COMPENSATION SUBMISSION TRIAL

No	Name	Results	Information
1.	<u>Achmad Alfa Zuhri A.</u>	Successfully Submitting Compensation	No Errors Occur
2.	<u>Refita Salsa Billa Saputri</u>	Successfully Submitting Compensation	No Errors Occur
3.	<u>Muhammad Farooq Bahtiar</u>	Successfully Submitting Compensation	No Errors Occur
4.	<u>Hendico Ade R.</u>	Successfully Submitting Compensation	No Errors Occur
5.	<u>Amelia Feruzzi</u>	Successfully Submitting Compensation	No Errors Occur
6.	<u>Fany Aflya Visca M.</u>	Successfully Submitting Compensation	No Errors Occur
7.	<u>Destanuari Sufia Mukti</u>	Successfully Submitting Compensation	No Errors Occur
8.	<u>An Netta I.W.</u>	Successfully Submitting Compensation	No Errors Occur
9.	<u>Arif Cahyono</u>	Successfully Submitting Compensation	No Errors Occur
10.	<u>Nur Hanafi</u>	Successfully Submitting Compensation	No Errors Occur

9. Fingerprint Registration Trial on Telegram

In this trial carried out on users or students, students register fingerprints, and a notification will appear on Telegram. Is there a bug or not when operating Telegram to see fingerprint registration notifications for students. For this trial, a sample of 10 users was used to register fingerprints simultaneously. Later it will be seen from the 10 users whether there is an error or not in registering fingerprints. The results of user/user trials are shown in Table VII.



Figure 12. Fingerprint Registration Trial on Telegram

TABLE VII
FINGERPRINT REGISTRATION TRIAL ON TELEGRAM

No	Name	Results	Information
1.	Achmad Alfa Zuhri A.	Successfully Registered Fingerprint Notification Successfully Appears on Telegram	No Errors Occur
2.	Refita Salsa Billa Saputri	Successfully Registered Fingerprint Notification Successfully Appears on Telegram	No Errors Occur
3.	Muhammad Feroq Bahtiar	Successfully Registered Fingerprint Notification Successfully Appears on Telegram	No Errors Occur
4.	Hendico Ade R.	Successfully Registered Fingerprint Notification Successfully Appears on Telegram	No Errors Occur
5.	Amelia Feruzzi	Successfully Registered Fingerprint Notification Successfully Appears on Telegram	No Errors Occur
6.	Fany Afiva Visca M.	Successfully Registered Fingerprint Notification Successfully Appears on Telegram	No Errors Occur
7.	Destanuari Sufia Mukti	Successfully Registered Fingerprint Notification Successfully Appears on Telegram	No Errors Occur
8.	An Netta I.W.	Successfully Registered Fingerprint Notification Successfully Appears on Telegram	No Errors Occur
9.	Arif Cahyono	Successfully Registered Fingerprint Notification Successfully Appears on Telegram	No Errors Occur
10.	Nur Hanafi	Successfully Registered Fingerprint Notification Successfully Appears on Telegram	No Errors Occur

10. Trial Submission of Notification Compensation Received on Telegram

In this trial carried out on users or students, if the website user submits a compensation application with a notification received there is a bug or not when operating on a telegram to find out if a student compensation application has been received and notification via telegram. For this trial, a sample of 10 users/users applied for compensation simultaneously on the website with telegram notifications. Later it will be seen from the 10 users whether there is an error or not in submitting the compensation received on the website. The results of user/user trials are shown in Table VIII.



Figure 13. Testing Users or Students When Submitting Compensation with Received Notifications

TABLE VIII
COMPENSATION TRIAL ACCEPTED

No	Name	Results	Information
1.	Achmad Alfa Zuhri A.	Successfully Submit Compensation With Telegram Notification Received	No Errors Occur
2.	Refita Salsa Billa Saputri	Successfully Submit Compensation With Telegram Notification Received	No Errors Occur
3.	Muhammad Feroq Bahtiar	Successfully Submit Compensation With Telegram Notification Received	No Errors Occur
4.	Hendico Ade R.	Successfully Submit Compensation With Telegram Notification Received	No Errors Occur
5.	Amelia Feruzzi	Successfully Submit Compensation With Telegram Notification Received	No Errors Occur
6.	Fany Afiva Visca M.	Successfully Submit Compensation With Telegram Notification Received	No Errors Occur
7.	Destanuari Sufia Mukti	Successfully Submit Compensation With Telegram Notification Received	No Errors Occur
8.	An Netta I.W.	Successfully Submit Compensation With Telegram Notification Received	No Errors Occur
9.	Arif Cahyono	Successfully Submit Compensation With Telegram Notification Received	No Errors Occur
10.	Nur Hanafi	Successfully Submit Compensation With Telegram Notification Received	No Errors Occur

11. Trial Request for Compensation Notification Denied on Telegram

In this trial carried out on users or students, if the website user submits a compensation application with a rejected notification there is a bug or not when operating on the telegram to find out the application for student compensation is rejected and notification via telegram. Applications are rejected because the day chosen by the student is not scheduled for compensation or because that day has been chosen by another student. For this trial, a sample of 10 users/users applied for compensation simultaneously on the website with telegram notifications. Later it will be seen from the 10 users whether there is an error or not in submitting the compensation application being rejected on the website. The results of user/user trials are shown in Table IX.



Figure 14. Testing Users or Students when Submitting Compensation with Rejected Notifications

TABLE IX
COMPENSATION TRIAL REJECTED

No	Name	Results	Information
1.	Achmad Alfa Zuhri A.	Successfully Submit Compensation With Telegram Notification Rejected	No Errors Occur
2.	Refita Salsa Billa Saputri	Successfully Submit Compensation With Telegram Notification Rejected	No Errors Occur
3.	Muhammad Feroq Bahtiar	Successfully Submit Compensation With Telegram Notification Rejected	No Errors Occur
4.	Hendico Ade R.	Successfully Submit Compensation With Telegram Notification Rejected	No Errors Occur
5.	Amelia Feruzzi	Successfully Submit Compensation With Telegram Notification Rejected	No Errors Occur
6.	Fany Afiva Visca M.	Successfully Submit Compensation With Telegram Notification Rejected	No Errors Occur
7.	Destanuari Sufia Mukti	Successfully Submit Compensation With Telegram Notification Rejected	No Errors Occur
8.	An Netta I.W.	Successfully Submit Compensation With Telegram Notification Rejected	No Errors Occur
9.	Arif Cahyono	Successfully Submit Compensation With Telegram Notification Rejected	No Errors Occur
10.	Nur Hanafi	Successfully Submit Compensation With Telegram Notification Rejected	No Errors Occur

12. Trial of Fingerprint Biometric Tools for Fingerprints

In this trial conducted on users or students, students register fingerprints by attaching fingerprints to fingerprints. Is there a bug or not when operating the tool to do fingerprints when starting and ending to work on compensation. For this trial, a sample of 10 users was used to attach fingerprints to fingerprints simultaneously. Later it will be seen from the 10 users whether there is an error or not in attaching fingerprints to fingerprints. The results of user/user trials are shown in Table X.



Figure 15. Biometric Fingerprint

TABLE X
FINGERPRINT BIOMETRIC TRIAL FOR FINGERPRINTS

No	Name	Results	Information
1.	Achmad Alfa Zulri A.	Successfully Detect Fingerprint	No Errors Occur
2.	Refita Salsa Billa Saputri	Successfully Detect Fingerprint	No Errors Occur
3.	Muhammad Faroq Bahtiar	Successfully Detect Fingerprint	No Errors Occur
4.	Hendico Ade R.	Successfully Detect Fingerprint	No Errors Occur
5.	Amelia Feruzzi	Successfully Detect Fingerprint	No Errors Occur
6.	Fany Aflya Visca M.	Successfully Detect Fingerprint	No Errors Occur
7.	Destanuari Sufia Mukti	Successfully Detect Fingerprint	No Errors Occur
8.	An Netta I.W.	Successfully Detect Fingerprint	No Errors Occur
9.	Arif Cahyono	Successfully Detect Fingerprint	No Errors Occur
10.	Nur Hanafi	Successfully Detect Fingerprint	No Errors Occur

13. Trial To Download Compensation Free Evidence on The Website

In this trial conducted on students, if website users have finished working on compensation, they can download evidence on the student website as proof that student compensation has been paid off or successfully carried out. This test is carried out to prove whether there is a bug or not when operating the website for downloading evidence free of student compensation. This trial was carried out by trying to use 10 samples on students. Later it will be seen from the 10 users whether there is an error or not in downloading proof of free compensation on the website. The results of user/user trials are shown in Table XI.

TABLE XI
COMPENSATION FREE PROOF DOWNLOAD TRIAL ON WEBSITE

No	Name	Results	Information
1.	Achmad Alfa Zulri A.	Successfully Performed Download Proof	No Errors Occur
2.	Refita Salsa Billa Saputri	Successfully Performed Download Proof	No Errors Occur
3.	Muhammad Faroq Bahtiar	Successfully Performed Download Proof	No Errors Occur
4.	Hendico Ade R.	Successfully Performed Download Proof	No Errors Occur
5.	Amelia Feruzzi	Successfully Performed Download Proof	No Errors Occur
6.	Fany Aflya Visca M.	Successfully Performed Download Proof	No Errors Occur
7.	Destanuari Sufia Mukti	Successfully Performed Download Proof	No Errors Occur
8.	An Netta I.W.	Successfully Performed Download Proof	No Errors Occur
9.	Arif Cahyono	Successfully Performed Download Proof	No Errors Occur
10.	Nur Hanafi	Successfully Performed Download Proof	No Errors Occur

14. Analysis

Based on the test results, it can be analyzed that:

- a. In testing the admin (Table 1) when logging in there are no errors and can operate the website properly. The server used by the website, namely mysql firebase, is able to accommodate a large number of users so that the website remains stable. From the test results it can be seen that the website is stable when used for admin needs
- b. In the user test (Table II), from testing 10 users logging in simultaneously, there were no errors for the 10 users, and they could operate the website properly. The server used by the website, namely mysql firebase, is able to accommodate a large number of users so that the website remains stable. From the test results it can be seen that the website is stable when used for student needs.
- c. In the test carried out on the admin (Table III), namely by adding the number of compensation hours from testing 10 users, there were no errors for the 10 users and the website was able to operate properly. Admin adds the number of student compensation hours according to the data on the number of compensation hours. So students who have registered an account on the website, their names will appear on the admin website and then the admin will add the number of compensation hours. Then if it is done then on the student account website the number of hours of compensation will appear according to what was input by the admin. From the test results it can be seen that the website is stable when used for student needs.
- d. In the test carried out on the admin (Table IV), namely editing the number of compensation hours from testing 10 users, there were no errors for the 10 users and the website was able to operate properly. The admin will edit the number of student compensation hours when the student has paid off to make compensation. The number of compensation hours will be reduced if student compensation has been paid off and completed. So the number of student compensation hours can change. From the test results it can be seen that the website is stable when used for student needs.
- e. In the test carried out on the admin (Table V), namely adding compensation activities from testing 10 users, no errors occurred on the 10 users and the website was able to operate properly. The admin adds student compensation activities to the admin website, after the admin inputs compensation activities the compensation activities will appear on the student website. Students can choose freely as long as the compensation activities have not been chosen by other students. From the test results it can be seen that the website is stable when used for student needs.

- f. In the user test (Table VI), namely submitting compensation activities from testing 10 users, there were no errors on the 10 users and the website was able to operate properly. Students make compensation submissions on the student website in accordance with the compensation activities on the student website that have been inputted by the admin. So students can make submissions and are free to choose compensation activities that are on the website. From the test results it can be seen that the website is stable when used for student needs.
- g. In the user test (Table VII) from the test of 10 users registering fingerprints with website notifications simultaneously there were no errors for the 10 users and they could operate the website properly. So students register fingerprints or fingerprints on the device then a notification will appear on the admin website that students have successfully registered fingerprints. From the test results it can be seen that the website is stable when used for student needs.
- h. In the user or user test (Table VIII) from the test 10 users submitted compensation with notifications received on the telegram simultaneously, there were no errors for the 10 users and they were able to operate properly. So students make submissions on the website then students wait for admin approval. If approved by the admin, an approved telegram notification will appear and you can work on compensation according to the schedule and activities chosen by the student. From the test results it can be seen that Telegram is stable when used for student needs.
- i. In the user or user test (Table IX) from the test 10 users submitted compensation with rejected notifications on Telegram at the same time there were no errors for the 10 users and they could operate properly. So students make submissions on the website then students wait for admin approval. If rejected by the admin, a telegram notification will appear rejected, then students will be advised to work on compensation and can resubmit on the website. Submissions are rejected usually because the time chosen by the student is not right or on that day when the job is busy then another day will be suggested and students can choose the recommended day and then resubmit. From the test results it can be seen that Telegram is stable when used for student needs.
- j. In the user test or user (Table X) from the test 10 users registered fingerprints or fingerprints on the device. In this test there is a difference in the speed of reading fingerprints by fingerprint. The difference in reading speed is due to the different conditions of each student's fingerprints, some are wet with sweat, and some are dry but difficult to read or detect.
- k. In the user or user test (Table XI), namely downloading free of compensation when compensation has been completed or compensation has been paid off. From testing 10 users, there were no errors on these 10 users and they could download free of charge compensation when the student had actually completed his compensation obligations. Students can operate the website properly. From the test results it can be seen that the website is stable when used for student needs.

IV. CONCLUSION AND SUGGESTION

A. Conclusion

Based on the design and testing in this study, the following conclusions are obtained:

The website meets the stability criteria for use when the user/user and admin create an account, log in to operate the website simultaneously, the website remains stable and there are no errors. So that this website can be used for the needs of students or admins at the State Polytechnic of Malang Digital Telecommunication Network Study Program.

When reading fingerprints by the user/student, this depends on the speed of the student's fingerprint conditions, so the fingerprint conditions between students determine the speed of fingerprint reading. However, the fingerprint reading test is not very significant because it is not identical. It can be concluded that the fingerprint reading on the prototype by the user/student is very fast and precise.

Fingerprint readings on prototypes, websites and telegrams are also affected by the user's network conditions, if the connection conditions are unstable then the reading will also be slow. Because the process of sending data contained in the fingerprint prototype, website database and telegram requires a stable connection because the website is internet based.

It can be concluded that connection quality and network stability affect users' ability to operate this website. So that users can access features on websites based on websites and telegrams. From, the progress of the design, preparation, and testing of programs and tools, the following conclusions can be drawn:

B. Suggestion

From the tests that have been made, several suggestions are obtained that may later be developed, including:

The website is developed again by providing automatic features such as compensation-free notifications that can be sent via student e-mail and better features can be added to monitor students who are making compensation.

Better features can be added to monitor students who are compensating.

On the fingerprint prototype, you can add face detection attendance to overcome errors when reading fingerprints on the prototype and you can add an LCD display for fingerprints.

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