CONTROLLING SYSTEM DEVELOPMENT WITH ANTI SKIP FINGERPRINT BASED SMS GATEWAY (CASE STUDY BANDUNG SMK EAST)

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ABSTRACT

SMK East Bandung is a private school located on Jl. Raya Cinunuk No. 172, Cinunuk, Cileunyi, Bandung. Based on surveys and interviews conducted in East Bandung SMK many students who are frequently truant and were absent without explanation, and also the attendance and perekapan data is still manual.

Solution of permasalahn been described that with the construction of the fingerprint attendance system based SMS gateway that aims to minimize the absence of the students as well as the attendance and perekapan manul data again. Attendance fingerprint as a communication medium developed to prevent students who are often absent, and also can reduce the level of fraud such as data manipulation and storage absent

Based on the results of beta testing and black box can be concluded that this application can help the school to monitor student attendance. So with the fingerprint attendance application-based SMS gateway can mempercpat perekapan attendance processing data.

Keywords : Attendance System, Fingerprint, SMS Gateway, Fingerprint.

1. INTRODUCTION

Vocational School (SMK) East Bandung is a private vocational school located in West Java Province, organized by the Foundation Sapta Prakarsan which was established in 1997. SMK East Bandung at Jl. Raya Cinunuk No. 172, Cinunuk, Cileunyi, Bandung West Java, East Bandung 40623. SMK has expertise in offering programs ranging from Computer Engineering and Networks, Light Vehicle Engineering, Banking, Engineering motorcycles, Accounting, and Hotel Accommodation. East Bandung good vocational accredited by the Accreditation Board of West Java province in 2013.

Based on the results of a survey conducted in SMK East Bandung to teachers who teach as well as homeroom in place that nearly 75% of students are often absent and absent without explanation, and 60% of teachers feel difficulty in controlling the students who are truant or not present. Plus the students' parents consider their children always went to school every day, while there is a difference of student attendance data, due to the tough school to inform the parents that their children are often absent from school, parents only know her often absent from the report cards educational outcomes. It is also the result of an interview with Mr. Riyan Dwi Cahya S. Kom as the assistant principal said that the control carried out by the teacher or homeroom teacher to pupil still not up and recording student attendance is still done manually. Based on the above, the problem of exposure needed a system that could help the school in dealing with student attendance and provide information to parents that their children attend school, whether on time, late, or not signed at all (skip). Based on the time recorded on the system when students tersbut confirm their attendance at the tools available (fingerprint) recorded the next time will be sent via SMS gateway in the mobile phone the parents.

This saves time and is very efficient, and the school also can obtain a precise figure on student attendance. Thus it will be built a solution in the form of absentee application so that the application is expected to provide solutions to the problems that exist with the title "Development of Anti-truancy Controlling System With Fingerprint-Based SMS Gateway (East Bandung SMK Case Study)".

2. RESEARCH CONTENTS

2.1. Theoretical basis

Theoretical basis is a guideline used to direct that any material used in writing in accordance with the existing facts, the rules in force and in accordance with the proper resources and reliable. The cornerstone of the theory can also be used to provide a general overview of the background research and as a discussion of research results.

2.1.1. biometric

Biometrics is a technology that many main function is to identify a person by their characteristics, such as fingerprints, face, eyes or other body parts, as well as how to walk, smell, sound, and signature. Biometric hard to forge, as it requires special expertise and cost a bit to forge biometric someone. But some biometric can be easily stolen, this action is much cheaper and easier than faking it. Suppose a thief had taken pictures of a person's fingerprint to fool the system, so that when the fingerprint image is scanned by a fingerprint reader, the system thinks it is the correct fingerprint. [1]

2.1.2. Fingerprint

The fingerprint is a pattern consisting of friction hills found on the human finger is hills and valleys. The hills are believed to be formed during the stages of human embryos and did not change his life. The physical structure of the hill formed based on factors genetic composition. The basic characteristic of the fingerprint as follows.

1. Fingerprints human hands and feet are formed before birth and never changed his life. The hills on the fingerprint consists of individual characteristics, the tip of the hill (ridge endings), branching two (bifurcations) and various forms of a hill. Relations unit of each of these characteristics in the fingerprint does not change a lifetime of up to decomposition after death.
2. Fingerprints and toes everyone has three characteristics (ridge bifurcation is referred to as minutiae) appear in various combinations that never repeated on two people. [1]

2.1.3. SMS Gateway

SMS Gateway is an application that allows us to receive or send text messages, instead of telecommunication devices (mobile phone, modem). When we receive and send sms, then we will use the functions and buttons that exist on the phone.

SMS Application Gateway provides an interface that is similar to mobile phone, to perform these functions. In addition, SMS Gateway also be used to automate the management of text, such as sending text messages to multiple destination numbers, reply sms automatically and so on, depending on the application's SMS Gateway is designed.

So, SMS Gateway application does not completely replace the function of a telecommunications device (mobile phone, modem). SMS Gateway still requires the hardware to communicate with the telecommunication provider's network. SMS Gateway simply replace the function of the interface (interface), which previously had to be done directly from the phone / modem, can now be done from SMS Gateway application. SMS Gateway application was made to add funsgsi-automation functions related to the management of SMS.

SMS Gateway users may have already frequently encountered but we do not realize, for instance on web applications that already use SMS as a means confirmation of membership, events televis lottery, premium SMS services, notification of communication service providers and others.

The superior features that are often found in the SMS Gateway is:

1. Auto Reply / Auto Responder.
   This feature will automatically reply to SMS messages from users who type in a specific code, in accordance with the format that has been set. The most obvious example is the use of auto-reply feature in the program / advertisement on television that show ads "Type REG".
2. SMS poll
   It is usually used in a television talent show, when you are asked to send sms support to the participants that you like, eg type IDOL <space> Virza.
3. broadcast Message
   This feature allows sending SMS to many different destinations, While on the phone today this feature is provided, but must add the destination number one by one. With SMS Gateway application that can be better regulated.
4. Scheduled Message (SMS delivery scheduled)
   This feature allows us to send SMS at a time that is predetermined. For example, for a birthday greeting or message reminder. [2]

2.1.4. *fingerprint* Solution 303

Attendance Machine + Door Access Control integrated with the best fingerprint sensor. This machine is also equipped with USB Disk Port, Wiegend Port, Web Server Function, SMS Message Function, and Alarm function which is able to detect the door is not closed or opened Forced Meeting. This machine is able to work well in the long term and have high stability. Broad Technology Support of this machine will answer various companies and factories that need at a complex solution, a comprehensive and integrated. [2]



Picture. 1 Solution Fingeprint 303

2.1.5. GSM modem Huawei E1750

Like most 3G modem Huawei E1750 USB drive to install himself as the on-board software. Very easy installation, plug the USB ported devices and drivers installed automatically. When Autostart USB disabled, simply click the Autorun.exe program on the USB driver in the computer folder. The software also installs Huawei's connection manager software to manage network connections. Huwei modem E1750 was immediately recognized by the GSM modem as a SMS Gateway Server, the modem uses two virtual serial ports, in this case COM3 and COM9.



Picture. 2 Modem Huawei E1750

2.2. Analysis And Design

2.2.1. analysis System

System analysis is an activity of the decomposition of a system that is intact and visible into parts or components of a computer that aims to identify and evaluate the problems and obstacles that may often occur that lead to a solution for the improvement and development towards the better and according to the needs.

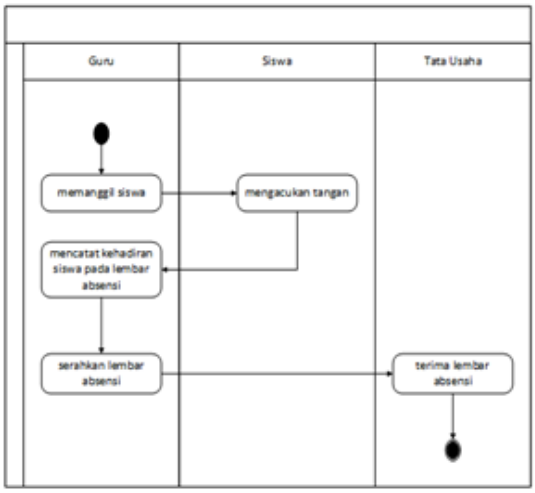
2.2.2. Problem analysis

From the observation of the system is running at SMK East Bandung there are some problems as follows:

1. Problems student attendance process is still done manually, ie by students fill out the sheet of paper and tekadang teacher calls students one by one in the classroom so it takes quite a long time.
2. Student attendance problems, dimna the parents consider their children always went to school every day, while there is a difference of student attendance data.
3. Homeroom yet maxima in monitoring the presence of male and female students so much that often truant.

2.2.3. Analysis Of Current System

Analysis of the current system is a process of decomposition of existing or ongoing absentee system with the aim to perform an existing evaluation, formulate goals to be achieved with the new system, and develop a system development plan. Based on the observation result which has been done and the interview with related party, the running procedure is as follows :



Picture. 3 Filling Process attendance

2.2.4. Analysis of Proposed Procedures

Here is the procedure proposed for East Bandung SMK:

1. Schools are no longer using the attendance sheet for use fingerprint technology
2. Students confirm their attendance by means of fingerprint
3. Administrators can view attendance data and print out the results of recapitulation through the application.

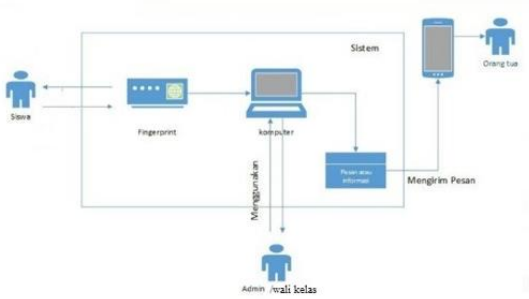
2.2.5. Analysis System To Be Built

Technology absenteeism is an application that can help the school to confirm their attendance for students. The purpose of this attendance technology are as follows:

1. Easing the administration in managing absence and recapitulation of data through the application.
2. Facilitate in providing student attendance information to parents via SMS gateway.
3. Let students confirm their attendance by using a fingerprint.

2.2.6. System Architecture

Applications built this system is a system that can help the school SMK East Bandung in dealing with student attendance, and facilitate the attendance of students giving information to parents and guardians via sms messaging gateway. The following attendance system architecture to be built can be seen in Figure 4.



Picture. 4 System Architecture

2.2.7. Hardware Analysis

Analysis of hardware requirements needed to meet the applications to be run can be seen in Table 1.

Table 1, Hardware Requirements Analysis

No.	Hardware	Specification
1	processor	2.16 Ghz
2	monitor	Monitor resolution of 1368 x 768
3	RAM	2 GB
4	VGA	1 GB
5	Mouse	Standard
6	keyboard	Standard
7	fingerprint	Fingerprint solution 303
8.	Modem	Modem Huawei E1750

2.2.8. Analysis Software

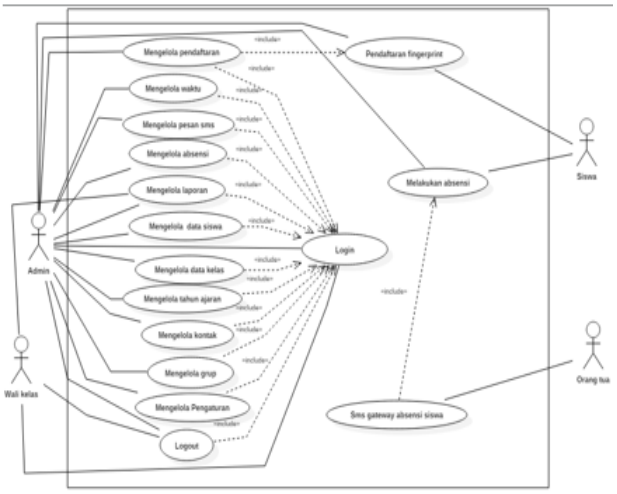
The software used in the construction of this system is as a medium to program the hardware so that the hardware can run the monitoring system in accordance with the working system to be built, it can be seen in Table 2.

Table 2 Software Requirements Analysis

No.	Software	Specification
1	Operating system	Windows 10.
2	Xampp	3.2.1
3	browser	Google Chroume

2.2.9. Use Case Diagram

*Use case diagrams*used to describe a number of external actors to use case contained in the system. Use case diagrams describe the state of the environment is only a system that can be seen from the outside by the actor. Use case consists of three parts, namely the definition of actors, the definition of use cases and use case scenario. Use case contained in this application development can be seen in figure 5 :



Picture. 5 Use Case Diagram

2.3. Implementation And Testing

2.3.1. Hardware Implementation

Hardware specifications used for developing applications Controlling anti-skipping system with fingerprint-based sms gateway in vocational East Bandung is as follows.

Table 3 Hardware Implementation

Hardware	**Specification**
processor	2.16 Ghz
monitor	Monitor resolution of 1368 x 768
RAM	2 GB

VGA	1 GB
Mouse	Standard
keyboard	Standard
fingerprint	*Fingerprint solution 303*
Modem	Modem Huawei E1750

2.3.2. Software Implementation

Software specifications used for the construction of system applications Controlling anti-truancy with Fingerprint-based sms gateway in vocational East Bandung is as follows

Table 4 Software Implementation

Software	Admin
Operating system	Windows 10
web Server	Xampp v3.2.1
Programming language	PHP
browser	Google chrome

2.3.3. implementation Class

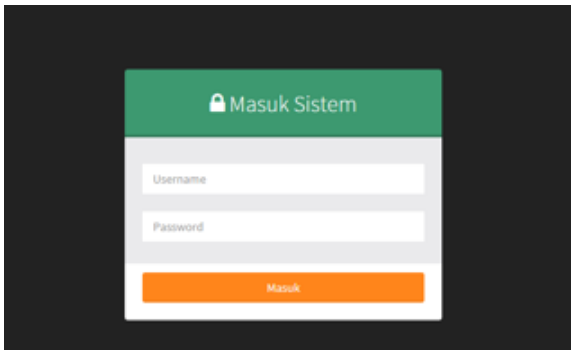
Implementation File is an implementation of the design in the form of class diagrams based on the use case diagram into physical shape and course files in the manufacturing processes in the system, in this study used the programming language PHP. Here's a model file found on the attendance system can be seen in Table 5.

Table 5 implementation Class

No.	Class name	File name
1	classBootsrap	classBootsrap .php
2	classConfig	classConfig.php
3	classExcelReader	classExcelReader.php
4	classForm	classForm.php
5	classSQL	classSQL.php

2.3.4. implementation interface

1. Here is the implementation of the login interface that is used to enter the main menu,



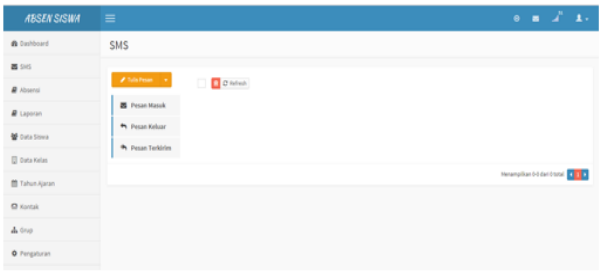
Picture. 6 Login page

2. Here is the implementation of the main menu page after login.



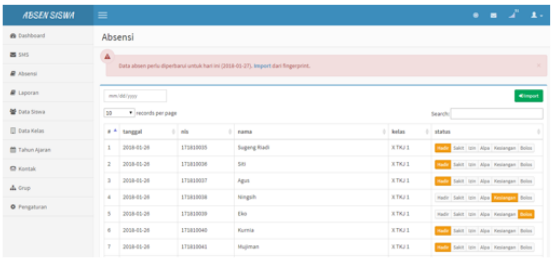
Picture. 7 Main page

3. Here is the implementation of SMS menu used to write and receive messages.



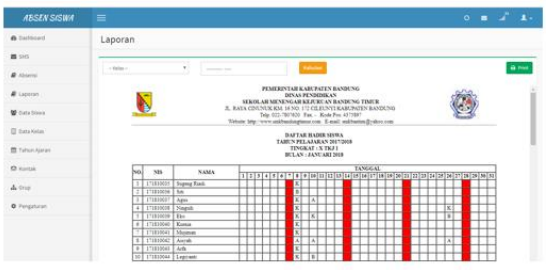
Picture. 8 Implementation of SMS Menu

4. Here is the implementation of the processing attendance used to import attendance data, display data absent.



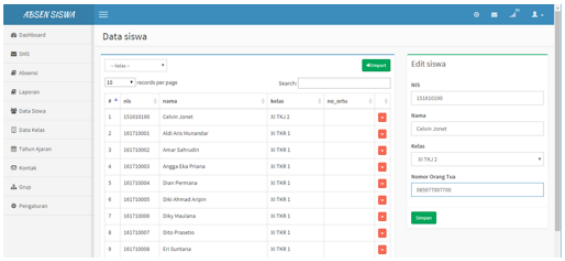
Picture. 9 Processing Implementation Attendance

5. Here is the implementation of report processing used to recapitalize the report data.



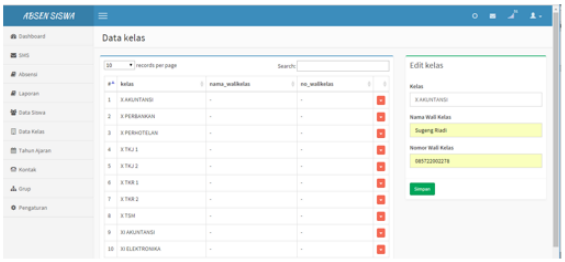
Picture. 10 processing Reports

6. Here is the implementation of student data processing used to increase student data, student data import, edit and delete student data



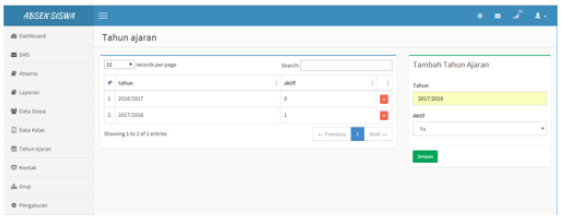
Picture 11 Student Data Processing

7. Here is the implementation of a class of data processing, which is used to add classes, edit and delete a class.



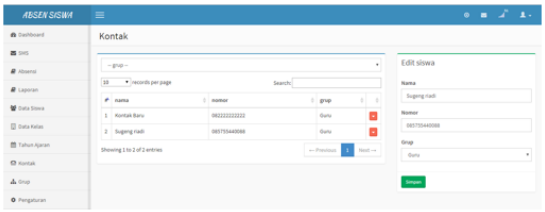
Picture. 12 Class Data Processing

8. Here is the implementation of the processing of the academic year that is used to increase the school year, changing and deleting of the school year school year.



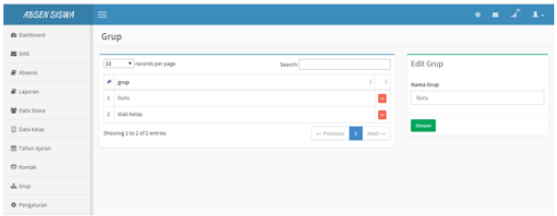
Picture. 13 Processing Academic Year

9. Here are the contact processing implementation, which is used to add, modify and delete contacts.



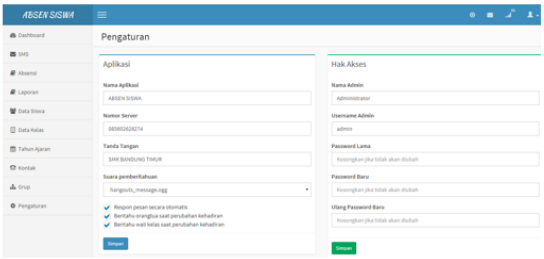
Picture. 14 processing Contacts

10. Here is the implementation of the menu processing group, is used to add, modify and delete the group menu.



Picture. 15 processing Group

11. Here is the implementation of the processing arrangement.



Picture. 11 processing Settings

2.3.5. testing Systems

Testing of the system is the cornerstone that aims to find errors or omissions in the information system under test. System testing is to determine the performance of the information system that has been made in accordance with the purpose of information system design. Type Testing conducted which include Functionality and Usability Testing.

2.3.6. Black Box Testing

Black box testing is to test the software in terms of functional specifications without dank ode test program design. The test is intended to determine whether the functions of the input and output of the software in accordance with the required specifications.

2.3.7. Beta testing

Beta testing is testing conducted objectively where tested directly by the user (Admin and homeroom), using interviews and questionnaires on user responses to the attendance system has been built.

2.3.8. Fingerprint testing

fingerprint is an important part of reading data from the fingerprint, and this test is conducted to determine whether the fingerprint can detect fingerprints when attached to a fingerprint or not

Table 6 Testing Against Old Read Fingerprint Fingerprint

trial to	Old Read (seconds)	legible
experiment 1	2	Yes
experiment 2	3	Yes
experiment 3	3	Yes
experiment 4	3	Yes
experiment 5	3	Yes

2.3.9. Huawei GSM Modem Testing

The function of this module is used to determine the length of sms delivery to the destination number with the status of sent or not.

Table 7 Old Testing Messaging

trial to	Old Post (seconds)	sent
experiment 1	5	Yes
experiment 2	7	Yes

experiment 3	10	Yes
experiment 4	15	Yes
experiment 5	20	Yes

3. Closing

3.1. Conclusion

After doing the analysis stage design implementation and testing it can be concluded as follows:

1. All the activities of student attendance can be managed by the admin, and the homeroom that can monitor the presence of students through the application of absenteeism
2. Application attendance system can help provide information to parents that their children attend school.
3. Application student attendance system can speed up the attendance data perekapan every semester.

3.2. Suggestion

Application student attendance system using fingerprint fingerprint that will apply in Bandung SMK East is still much to be improved, so that the necessary development of the system yaiut:

1. To enhance attendance system with fingerprint application should be created an additional application to communicate data to a web app's fingerprint with time attendance to validate the data so that administrators do not need to mengimportkan data manually into terbsebut application.
2. Integrate with other systems, such as the school's academic system, to be connected between the attendance data and other academic data. So you can help the school system is digital and smart.

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