

i-ttendance, Solution for Academic Cheating

Developed with CodeIgniter and Android Studio

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Cheating on absence system is a common act in the society. This kind of behavior is an example of corrupt behavior which should be considered a bad habit. For this reason, writer has an idea to make a system that can prevent this act of cheating. This system consists of website server (CMS) and an Android application. This android application will be used as a tools to check whether a student is presence through fingerprint recognition. On the other hand, CMS is used for student data recapitulation. Writer hopes that through this system, the act of academic cheating will be lessened.

Keywords—CodeIgniter; android; fingerprint; CMS

I. INTRODUCTION

Based on governmental regulation Num. 31 year 1999 about prevention of criminal act of corruption, actions that are considered as an act of corruption are: “Any person that are against law, doing an act that make him/herself richer, giving profit to him/herself or other person or corporation, misusing authority or chance or infrastructure that he/she has due to position or power which can make a loss to the country or country’s economy.”

Act of corruption is a common news in Indonesia. Corruption that are done by corruptor are caused by a corrupt way of thinking and behavior. One of the reason that cause the increasing number of corrupt way of thinking and behavior is people’s lack of knowledge on the meaning of being corrupt. Moreover, individual’s lack of integrity is also an important factor which can cause an individual to drown on corrupt mentality.

In a formal education activities, there’s always an absence system which is used to determine whether a student is present in a class. This system usually use simple paper media in the form table that are distributed to the class attendees. Students fill in the cell according to his/her name and the date of the class with his/her signature to prove that he/she attended the class. Despite signature being used as a prove to prevent cheating, students always find a way to cheat on the system. This is an example of a corrupt act that is done by student(s). This corrupt behavior are done by faking student(s) behavior so that he/she are considered to be present in the class. This can actually be prevented by the teacher by calling each students

name to make sure that they are present. Although it’s possible to do this, it takes too long and waste a lot of energy.

Time that are spend to call each students is too long and inefficient. Because of this reasons, writer has an idea to develop a system which can be used to detect act of cheating on absence system. This system is called i-ttendance which consists of website server (CMS) and android application. Android application is used as an infrastructure for the absence system, while the website is used to do the recapitulation of students data. Android application will detect students fingerprint and send it to the server.

II. LITERATURE STUDY

A. CMS

CMS is a system used to manage and facilitate the process of creating, updating, and publishing content together (collaborative content management). Content refers to information in the form of text, graphics, images and in other formats that need to be managed with the aim of facilitating the process of creating, updating, distributing, searching, analyzing, and increasing the flexibility to be transformed into other forms. The CMS terminology itself is quite extensive, including application software, databases, archives, workflows, and other tools that can be managed as part of a corporate and global information network mechanism.

B. CodeIgniter

CodeIgniter is a PHP framework that is open source and can be used for free. CodeIgniter uses MVC (Model, View, Controller) methods. Explanation of MVC framework is as below:

1. Model

Models are part of CodeIgniter which is used to retrieve data from the database. The model serves as a handling and processing database. The instructions connected to the database are in the model.

2. View

View is the part that handles the user interface or the appearance of the website page. View separated to

facilitate the website designer in processing interface of the website.

3. Controller

Controller is the part that links the model and view. The controller will process the instruction from the model so that the view does not contact the model directly. However, view must passing the controller first.

C. Android Studio

Android Studio is an Integrated Development Environment - Integrated Development Environment (IDE) for Android application development, based on IntelliJ IDEA. Android studios also offer more features to improve user productivity, such as fast emulators, runs without having to create new APKs, C ++ and NDK support, and support from GCM (Google Cloud Platform) so integration into GCM and app engines is easier. Android Studio supports various versions of the control system, including Git, GitHub, CVS, Mercurial, Subversion, and Google Cloud Source Storage.

By default, Android Studio will display your project files in the Android project view, as shown in Figure 1. Views are organized by module to give you quick access to your project's main source files. All version files are visible at the top under Gradle Scripts and each application module contains the following folders:

- manifests: Contains AndroidManifest.xml file.
- java: Contains Java source code files, including JUnit test code.
- res: Contains all non-code resources, such as XML layout, UI strings, and bitmap images.

Android Studio uses Gradle as the base version system, with Android-specific capabilities provided by the Android Plugin for Gradle. This system can be run as an integrated tool from the Android Studio menu and independently from the command line.

D. Fingerprint

Fingerprints are one of the identities attached to each individual. Fingerprints can be used to identify others. The fingerprints become technically quite reliable, as they are proven to be relatively accurate, safe, easy, and convenient to be used as identification when compared to other biometric systems such as the eye retina / DNA. To put it simply the fingerprint reader works by recording one's fingerprint and then save the typical pattern of the fingerprint. Fingerprint identification is done by matching previously stored data. If data is the same, then access will open.

Readers work with fingers read the pattern on the finger. On the day of the day there is a complicated pattern, which if all is used for identification it will take a long time. However, if the pattern is simple then the scan will be less accurate and easy to break. Thus, the solution of fingerprint scanning is to capture three types of patterns in the fingerprint flow. The pattern taken is that have thicker ink when doing fingerprint. The patterns include ridge ending, bifurcation, and short ridge.

These three fingerprint details are never be the same on each individual.

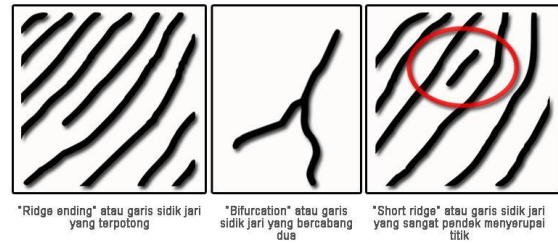


Image 1 Fingerprint details

Source:<http://tekno.kompas.com/read/2016/07/19/11340027/begini.cara.kerja.sensor.fingerprint.pada.smartphone>

To scan, the machine needs sensors. There are many types of sensor to read fingerprint. The system typically used on smartphones is the capacitance system. The system uses electronic devices such as capacitors to scan fingerprints. The capacitor stores the electrical charge connected to the conductive disk on the smartphone screen so that it can be used to track fingerprint details.

The electrical charge on the capacitor will change slightly as the protruding line sections of the fingerprints are attached to the conductive disk. Meanwhile, the interlaced lines that stand out have almost no effect on the capacitor. From here, fingerprint image was obtained.

III. I-TTENDANCE APPLICATION

i-ttendance is an application consisting of two parts, website and android app. Android app becomes as a student attendance tool. Students can search for their name and put their finger on hardware that has a fingerprint sensor. Android will send incoming attendance data and send it to the server. The list of students seen on android is also taken on the data stored on the server.

i-ttendance system works on smartphone that features fingerprint scanner to connect to a database. At the beginning of the semester, the fingerprint of all students in the class are saved and stored in the database. In each class session, i-ttendance absence system are distributed to students and used to indicate whether the student present in the class or not. Attendance data is stored in the database and can be accessed by administrative employees responsible for student attendance. During the time of system development, the system is only able to store a single student fingerprint due to the limitation of the smartphone.

A. CMS

Framework that is used for the CMS system is CodeIgnitor. Below is the look and explanation of the website's functionality.

- Login

The starting interface on the CMS is the login interface for admin. When a user login, the system will check the login credential on administrator database.

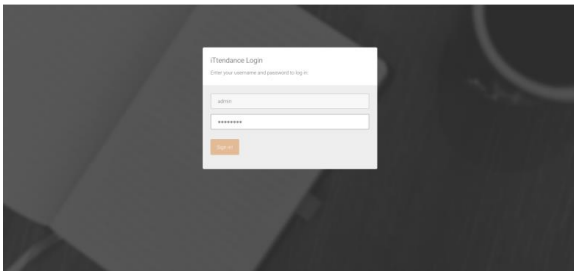


Image 2 Login
Source: User documentation

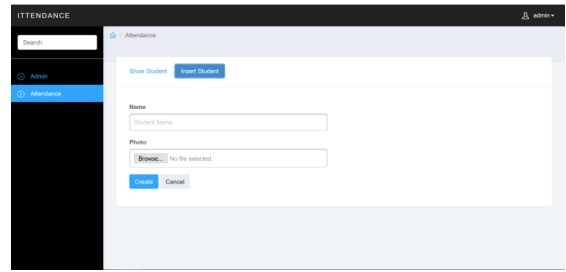


Image 5 Adding Student
Source: User documentation

- Administrator List

The next interface is a list of administrator for website owner. This interface only showed to website owner. It's functionality is to adjust administrator settings, including adding, removing, or editing list of admin. View will process data taken from the database that is done by model and sent through controller.

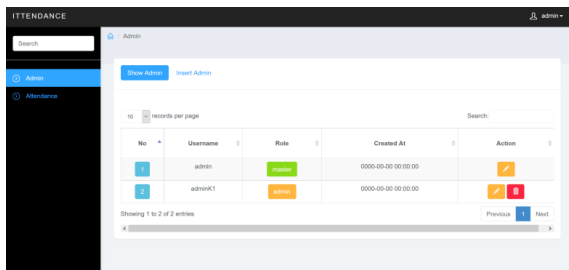


Image 3 Administrator List
Source: User documentation

- Student List

This page contains list of students. It has the function to show the latest present hour of the student, editing student information, and addition or removal of student.

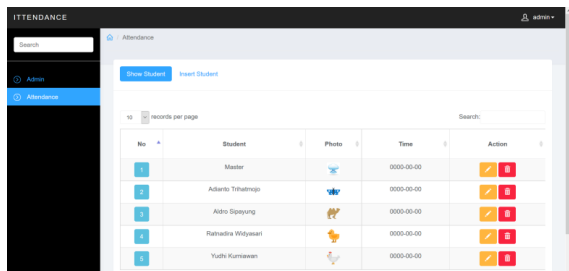


Image 4 Student List
Source: User documentation

- Adding Student

Administrator can add new students by inserting student's data and clicking the create button.

- Search Student

User can search for student information by typing the name of the student.

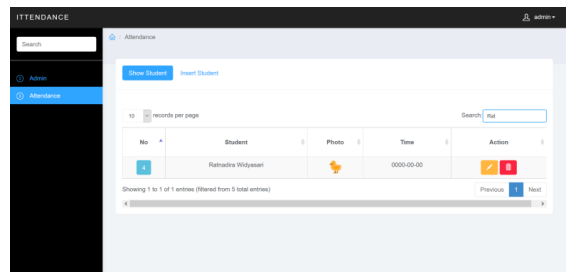


Image 6 Search Student
Source: User documentation

B. Android

Below are the interface and explanation of the Android application.

- Splash screen

When the application is opened, it will show the product's logo for a few seconds. This logo is the launcher main activity. Therefore, when the application is opened, this screen is the first screen shown.



Image 7 Splash screen
Source: User documentation

- Student List

The next thing that will be shown is the list of student that is enlisted on the class. Students data are taken from the database. This data retrieval are done through retrofit library which are used to take data from

the CMS. Retrofit library which is used is Squareup retrofit. Usage of this library make prompt the application to ask for permission to use internet.

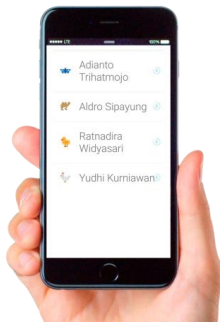


Image 8 Student List
Source: User documentation

- Fingerprint reader

After the user choose a student's name, the user can put his/her finger on the fingerprint reader. If the fingerprint that is being read match the one that is being recorded, the application will send it to the database. Fingerprint reading require the permission to use fingerprint. Information sending to the database is also done through retrofit. Retrofit will access the website by sending student's name and check in time.

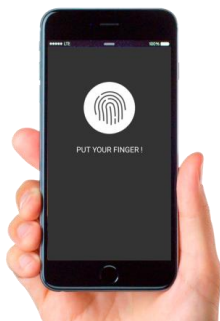


Image 9 Fingerprint reader
Source: User documentation

IV. CONCLUSION AND SUGGESTION

This product can be used as an alternative in the attempt to prevent corrupt act in academics environment. This easy, cheap, and attractive option is a plus because it can be used by anyone and anywhere. Writer hopes that this product can minimalize academics cheating like in the absence system.

Disadvantages of the system is the system requires a device that can read the finger print. As we know that devices that can read the fingerprint is not cheap. Furthermore, the other deficiency is fingerprint can still be deceived, so do not

guarantee 100% will eliminate cheating. The fingerprint fraud can be done by creating artificial silicon against the desired fingerprint. Then, there is the possibility of theft of tools and smartphones used for absenteeism by irresponsible parties.

The deficiencies described above can be resolved in various ways. Device for fingerprint can be used device made in china so that price is much more affordable. Provision of devices is also done not based on each class, but each teacher so that the number of devices needed will be much more reduced. It also opens up opportunities for teachers to volunteer to use their own devices to become a means of presenting.

Fingerprint fraud is difficult to do because in addition to expensive, when caught given the sanctions will be heavy. The way to prevent it is to use a limit when using a fingerprint. So that when tried many times, it will be recorded by the system and can be suspected.

Furthermore, to prevent theft can be done by downloading the application to detect smartphone theft and turn on the application before the smartphone is played in the classroom and use a proximity sensor that will sound an alarm if the smartphone is taken too far from the class.

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Bandung, 5 May 2017

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