PROTOTYPE OF HOME SECURITY SYSTEM USING ARDUINO BASED ON ANDROID AT HIJAB HOME INDUSTRY

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ABSTRACT

Hijab home industry which is located in perumahan hegarmanah indah blok hg no 13 rt03/12 cicalengka. This house produces convection hijab, ranging from fabric to become a finished product that could be marketed. The problems faced by the owners is upon delivery of the goods, the owners should leave the place of production. Because the delivery is done by the owner after workers completing the process of producing goods, these problems can provoke theft because of the conditions of production in an empty state without security system. Therefore in this study made prototype of home security system used to detect the movement of people in the home industry and provide information to the owners home industry hijab.

Prototype of home security system is a security system using the Arduino microcontroller as an alarm, and the human motion detection device which is connected to your Android smartphone via internet connection as a medium of information to the owners home industry when human movement is detected.

Based on alpha and beta testing can be concluded that a system built to help the owner of the home industry in receiving information in the form of pictures and history data of the incident if there is movement (human) in the home industry through Android smartphone to the owner of the home industry wherever and whenever.

Keywords *: Prototype, Home Security System, Arduino, Android, Home Industry.*

1. INTRODUCTION

Hijab home industry that located in perumahan hegarmanah indah blok hg no 13 rt03/12 cicalengka is a convection or regular houses called home industry that produces hijab, starting from fabric, fabric-cutting process, the process of tailoring, to become a finished product that can be marketed. Home industry this hijab began to stand in 2011 until now, although still fairly new in terms of entrepreneurship but its market coverage can not be considered one eye, among others, Bandung, Cirebon, Jakarta City, even shipping the product until the matter was done to Borneo to expand its market.

This hijab is a home industry in terms of producing the hijab had about 8 people are workers who are expert in making and designing hijab, which operates starting from 09.00 am to 16.00 pm, special delivery area of Bandung and its surroundings were done every day after the production process is completed to the stage of packing or packaging, delivery is made directly to send goods transport vehicles use to traders who had first ordered its products.

The problems faced by the owner of the home industry this hijab was padasaat delivery of the goods should leave its production conditions in a State is empty because all the activities conducted in the home industry hijab that have been completed and any workers return home as scheduled, because it was the owner of the home industry this hijab is always anxious when her home or place of production were left in the empty state with the condition there are many valuable items such as production materials , finished products, production machines, money.

Police in West Java at the end of year 2015 release level criminality occurred during 2015 in their jurisdiction. Of note, Bandung became an area with the highest crime rate, i.e. 4,016 with cases, followed by the Regency of Bogor (3,621 matters), and Kabupaten Bandung (2,224 case). Crime in West Java, according to Kapolda Jabar, Inspector Pol Moechgiyarto, still dominated by street crime and thuggery. In police records, theft with pemberatan happens 2,858 times, theft with violence 791 cases, while motor vehicle theft cases 5,192 [1].

The crime of theft/burglary of the House contains the kinds of theft with pemberatan who reach 2.858 cases, this should be immediately alerted the U.S. not to run so rampant, one of which is by way of securing our homes with an adequate security system especially for home-based business owners security system is urgently needed because many of the goods that should be diamanakan from acts of theft.

At the moment there are home security systems offered by the owner of the provider and owner-the owner of the telecommunications industry, one that is Speedy Monitoring, but the price offered by the owner of the provider are still classified as expensive and not including the monthly bills and so on, thus it takes a home security system that is appropriate and affordable in terms of financially for owners of home industry hijab.Based on the existing problems and also the results of the interview directly to the owner of the home industry Mr. hijab Totoh Abdul Salim i.e. requires a security system that is able to monitor and provide information in a long distance to be applied on the hijab home industry.

Therefore, the prototype home security system using arduino android based on home industry hijab will serve as a solution to existing problems. This is reinforced by the use of the Android smartphone that has been interviewed previously to the owner of a home industry hijab, that he agreed with the construction of the security system of the prototype.

1.1 Home Security System

home security system can be interpreted as a mechanism that is designed in such a way that is used to secure your home from unwanted owners by providing early warning to the security officers as well as homeowners.

1.2 Microcontroller

According to Setiawan [8] Microcontroller is an IC with a very high density, where all the parts necessary for a controller already packaged in one chip, usually consisting of a CPU (Central Processing Unit), RAM (Random Access Memory), EEPROM/EPROM/PROM/ROM, i/o, Serial Parallel, Timer, & Interupt Controller.

According to Winoto [8] Ardi "Microcontroller is a microprocessor system which it already contained the CPU, ROM, RAM, I/0, clock and other internal equipment that's already connected and well organized by the factory of manufacture and packaged in one chip that is ready to use, so we dwell program the contents of ROM in accordance with the terms of use by the factory of manufacture".

Based on the definitions set forth above it can be concluded that microcontroller is an IC that is designed or constructed by a very high density, where all the necessary parts of a controller already packaged in one chip, usually consisting of a CPU (Central Processing Unit), RAM (Random Access Memory), EEPROM/EPROM/PROM/ROM, i/o, Serial Parallel, Timer, & Interupt Controller and function as a controller umunya as well as electronic circuits can store a program in it.

1.3 Arduino

Arduino is an electronic circuit that is open source, and have hardware and software that is easy to use. The Arduino can recognize the surrounding environment through various types of sensors and can control lights, motors, and other actuators of various types. Arduino has many types, such as the Arduino Uno, Arduino Mega 2560, Arduino Fio, and more.



Image Source : www.arduino.cc [10]
Figure 1 Board *Arduino UNO*

1.4 Sensor PIR (*Passive Infra Red*)

The sensor is a component that converts physical quantity into quantity of electricity Franky chandra and Deni Arifianto, [12] s. Sensor used in this system are the Sensors of PIR.

PIR (Passive Infra Red) is an infrared-based sensors. However, unlike most of the infrared sensor, which consists of an IR LED and fototransistor. PIR does not emit any such IR LEDs. As the name implies "Passive", this sensor only responds to the energy of the beams passive infrared that is owned by any objects detected by him. Objects can be detected by these sensors are usually the human body. [13]

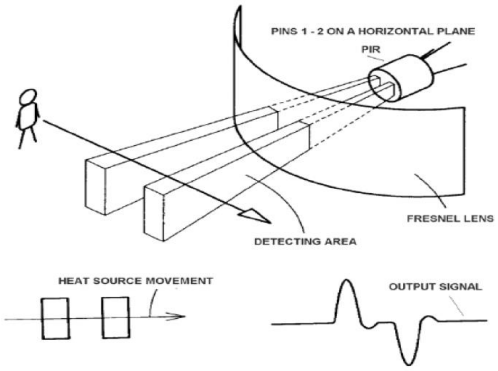


Image Source: Mohd. Syaryadhi [14]
Figure 2 Sensor PIR (Passisve Infra Red)

1.5 Camera VC0706

Camera VC0706 camera is a serial Microcontroller devices support against one of them is the Arduino, camera is connected on the Arduino board through port TX, RX, GND, 5V.

VC0706 has the image quality at 640 x 480, 320 x 240 or 160x120 JPEG format. On this VC0706 camera system used to capture images when a movement is detected.

1.6 Android

Android is an operating system for Linux-based mobile devices that includes an operating system, middleware, and applications. Android provides an open platform for developers to create their applications.

Android is a mobile operating system that grows in the middle of another operating system that is evolving today. Other operating systems such as Windows Mobile, i-Phone OS, Symbian and many more also offers a wealth of content and the keoptimalan runs on top of existing hardware devices. However, the operating system runs with prioritizing core applications that are built on its own without seeing considerable potential from the application owner. Therefore, the third owner of the application distribution limitations to their platform.

1.6.1 Android Architecture

The Android architecture can be described as shown in Figure 1 and in the outline of the Android Architecture can be explained as follows:

a. *Application* and *Widgets*

Application and Widgets this is the layer where we connect with applications only, where we typically download the application then we do installation and run the application.

b. *Aplication Framework*

Android is "Open Development Platforms" that Android offers developers or give capability to developers to build great applications and innovative.

c. *Libraries*

This is the layer where libraries features Android is located, typically the application makers access libraries in order to run the application.

d. *Android Run Time*

Layer that makes Android applications can be run where in the process using the Linux Implementation. Dalvik Virtual Machine (DVM) is the engine that forms the basic framework of Android applications.

e. *Linux Kernel*

The Linux Kernel is the layer where the core of the Android operating system. Contains files of the system governing system processing, memory, resource, drivers, and the operating systems of the other Android. The Linux Kernel used Android is Linux Kernel release 2.6.

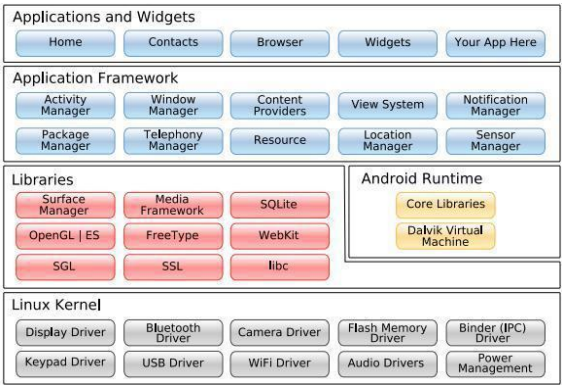


Figure 3 Android Architecture

1.7 *Web Service*

Web service is a computational entity that can be accessed through the internet or intranet with the standard protocol in a particular platform and language independent programming interface. The goal of development is to bridge the communication between programs, so that one application and other applications that are present on a network in the same or different network can communicate with each other as long as it uses the standard protocol defined by the web service.

1.8 *Google Cloud Messaging*

GCM (Google Cloud Messanging) is a service on the Android to run a Push Notification. In the Android service GCM is run by an application that runs in the background and the Google Service called Play. The service will build the application concerned a new notification when received and will display the notification on Android notification panel.

2. MAIN RESEARCH

2.1 Analysis Of The Problem

Prototype home security system using Arduino Android based on home industry's hijab is a mechanism that is designed in such a way that is used to secure the home industry circles hijab from unwanted owners by providing early warning to the owner of the House. As for based on research conducted there is problems occurred so that he made this system is as follows:

1. The owner of a home industry's hijab is always anxious when left in its place a State of empty and there is nothing to monitor conditions there are many valuables.
2. The owner of a home industry's hijab can not know the conditions of its production in case of acts of theft because production conditions with the owners far apart.

2.2 Analysis System

Prototype Home Security System Using Arduino Android based On Home Industry Hijab system is used for home security with the use of hardware and software devices namely Arduino UNO microcontroller that integrates with the Android mobile device over a network the internet, so as to provide the information the State House or place of production to the owner in case of something like a movement (man) in the area of the hijab home industry in conditions of distance between the place of production and the owner.

Following the analysis of the existing system on a Prototype Home Security System Using Arduino Android based On Home Industry's Hijab:

1. The system is controlled via Android applications that connect through the internet network.
2. in the application, users can set the security system by touching a button ON to activate the security system or OFF to turn off the security system.
3. in the application, there is a history of human movement of data that can be accessed through the android application so that users can find out when the occurrence of human movement who was captured by the motion sensor.
4. This application features see figure to see the image captured by the camera in the event of the movement.
5. Android application will display a security system in the form of notification in case of human movement.
6. On the side of the hardware IE the Arduino microcontroller UNO will be issued in the form of sound Output on the device the Buzzer will turn on when the motion sensor detects movement.

2.3 Analysis Of System Architecture

Analysis of system architecture are the stages to get an overview of the system to be built. Whether it is the image of the back end system as well as an overview of the system front end user or user. Picture of system architecture can be seen in the picture below.

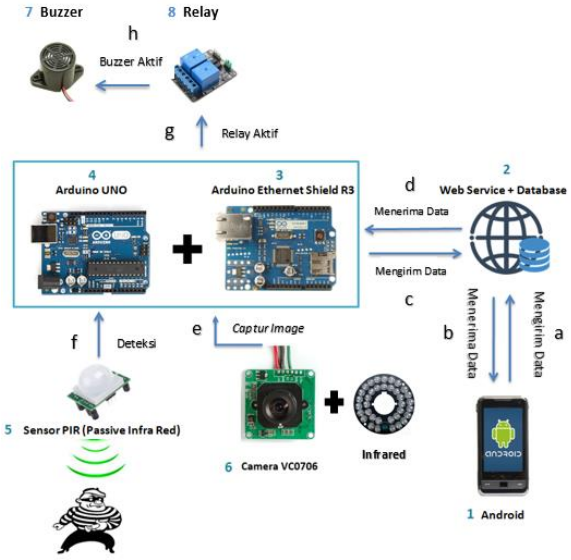


Figure 4 System Architecture

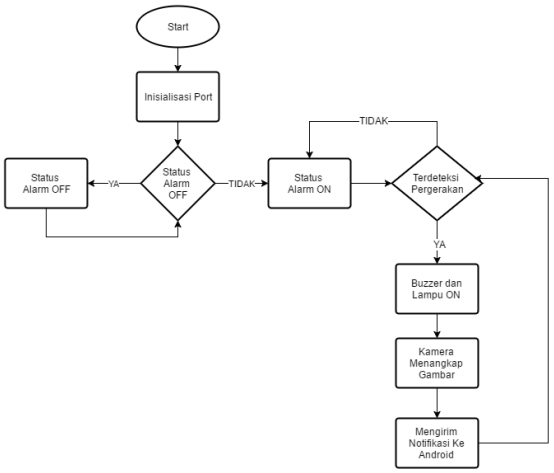


Figure 5 Work Process System

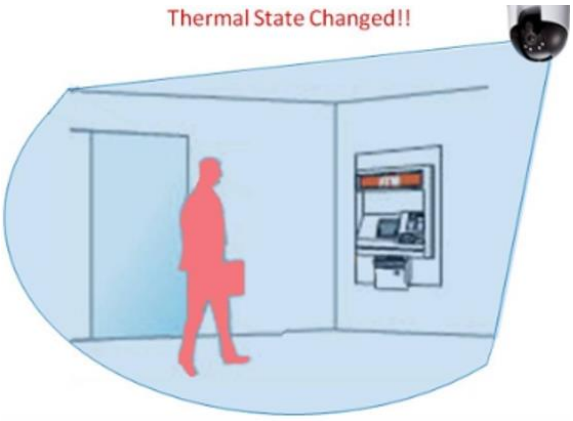


Figure 6 Detection Of Movement

2.3 Analysis Of Google Cloud Messaging

At this stage would explain about the description of the process of sending and receiving messages in the form of notifications between the device microcontroller, Google Cloud Messaging, and Android.

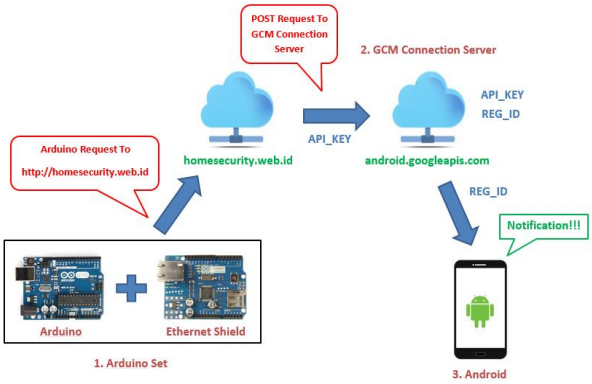


Figure 7 Google Cloud Messaging

2.4 *Use Case* Diagram

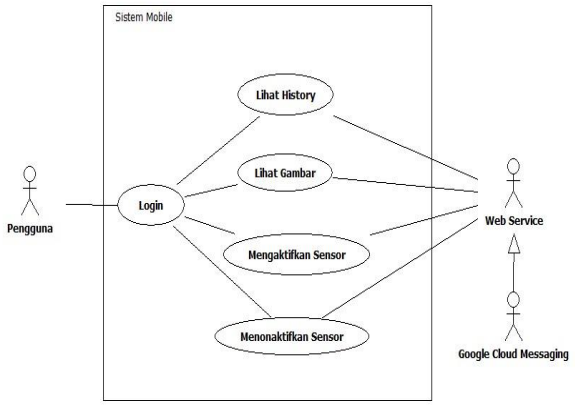


Figure 8 Use Case Diagram

2.5 The Design Of Mobile Systems

The design of the structure of the menu sub system mobile can be seen in the following image:

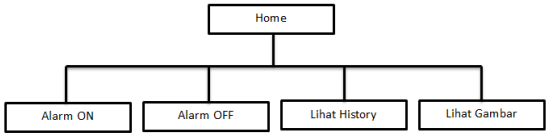


Figure 9 Menu Structure

2.5.1 The Design Of The Interface

The following image is a mobile interface design.



Figure 10 Main Menu



Figure 11 See History

3. CLOSING

3.1 Conclusion

Based on the results of the research, the analysis, the design of the system, and the implementation and testing of the interview, the following conclusions can be drawn:

1. This facility can help home industry owners in securing its place hijab at the time were left blank in the circumstances go.
2. Application of home security is able to assist in providing information in case of movement in the area of home industry hijab through Android

smartphone directly to the owner of the home industry wherever and whenever.

3.2 Advice

Prototype Home Security System Using Arduino Android based On Home Industry this hijab is still a lot of shortcomings. Therefore it needs to be done to further development and refinement. As for a few suggestions that may be applied to the Prototype Home Security System Using Arduino Android based On Home Industry this Hijab in order to be better still, is as follows:

1. Can use Raspberry PI in order to faster in processing and features such as streaming video can do.
2. Can add features to capture image manually by the user.

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