Introduction To Arduino-Based Internet Of Things (Iot) System In Sma Negri 1 Brbebes

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Abstract

The introduction of the Arduino-based Internet Of Things (IOT) system at Brebes 1 Public High School helped the students there to develop the system. We are here to introduce students to how Arduino functions in today's modern era. Apart from the function, we also introduce how Arduino works and how to operate Arduino in a school environment. As an example that can be used by Arduino in the school environment is attendance by detecting faces or you can use the retina of the eye. There are many examples that can be taken from case studies on the use of Arduino which can be applied to the Brebes 1 Public High School school environment.

The introduction of Arduino has many benefits for students at the school, because students can have many ideas that can be developed to make their school more modern or they can also make works which will then be published to introduce their school to the wider community. . Students can have a lot of ideas that they will develop and also because the equipment used in making the Arduino system is very affordable. Apart from the affordable price, Arduino is also not difficult to find equipment, because there are lots of Arduino equipment that are widely sold, both offline in computer stores or even online, which are sold freely.

Keywords:*Internet Of Things, Arduino Uno, systems, introduction, School, Arduino performance, Arduino functions.*

1. Introduction

SMA N 1 Brebes is one of the number 1 public schools in Brebes Regency. The quality of SMA does not need to be doubted in the application of learning that is carried out there. Most of the teachers at the school are graduates of well-known universities in Indonesia and are in accordance with their respective fields.

In the Brebes 1 Public High School environment, they still use a manual system, for

example student attendance still uses paper where students still have to be called one by one when taking attendance. After the students are called one by one, they are recorded in the student attendance ledger for each subject. By introducing the Arduino system to students there, students will develop a system that is still manual to be modern.

The introduction of the Arduino-based Internet Of Things (IOT) system at SMA Negeri 1 Brebes helps students to develop systems. We are here to introduce students to how Arduino functions in today's modern era. Apart from the function, we also introduce how Arduino works and how to operate Arduino in a school environment. As an example that can be used by Arduino in the school environment is attendance by detecting faces or you can use the retina of the eye. There are many examples that can be taken from case studies on the use of Arduino which can be applied to the Brebes 1 Public High School school environment.

The introduction of Arduino has many benefits for students at the school, because students can have many ideas that can be developed to make their school more modern or they can also make works which will then be published to introduce their school to the wider community. . Students can have a lot of ideas that they will develop and also because the equipment used in making the Arduino system is very affordable. Apart from the affordable price, Arduino is also not difficult to find equipment, because there are lots of Arduino equipment that are widely sold, both offline in computer stores or even online, which are sold freely. Formulation of the problem. The formulation of the problem based on the background described above is:

1. How does this Arduino system work for developments in schools.

2. What are the benefits derived from the introduction of Arduino to school development.

2. Method

2.1. School

School is a place for us to receive knowledge, from elementary school to high school/vocational high school/MA. By going to school, we will get knowledge according to age level. For example, if the ages of 7-13 years are placed in elementary schools (SD), while for ages 13-15 they are placed in junior high

schools (SMP), and for those aged 16-18 years they will be placed in senior high schools. (SENIOR HIGH SCHOOL). Inside the school consists of several employees, for example the principal who has the task of being a leader in the school. The teacher at school has a duty as a teacher who later the teacher will be guided to teach his students in giving knowledge.

According to Abullah (2011), the word school comes from the Latin, namely skhhole, scola, scolae or skhola which means free time or free time. School is a free time activity for children in the midst of their main activities, namely playing and spending time enjoying childhood and youth. Activities in spare time are learning how to count, read letters and get to know about morals (character) and aesthetics (art). To accompany children in school activities accompanied by experts who understand child psychology, so as to provide as many opportunities as possible for children to create their own world through various lessons. School is an institution designed for teaching students or pupils under the supervision of educators or teachers.

2.2 Monitoring

Definition of Monitoring Is the process of collecting data and information based on indicators that are determined systematically and regarding activities or programs corrective actions can be taken to perfect the next activities or programs. Monitoring is also activities carried out to monitor, measure, and assess the results of activities that have been carried out. The monitoring process is a process that is carried out routinely to measure the ability or progress of an activity or program that is already running, in monitoring data collection is carried out to measure the assessment process. Some monitoring objectives include:

1. Test whether the activity is feasible to continue or stop at that time

2. Finding problems that occur during the activity,

3. Assist in the activity assessment system whether the activities carried out have benefits or are not useful at all for other people

2.3 Arduino Uno

Arduino is an electronic circuit that is open source. Aruino can be used for prototypes for making detection sensors. The way Audrino works is to use a series of sensors which are then run using a program to detect movement. For example, for use during absences using a face detector. Our face will be sensored which will then identify whether it is our face or not when scanning.

Figure 1 Arduino Uno

2.4 Esp8266-01

ESP8266 is referred to as a System On Chip (SOC) which has the ability to connect to TCP/IP networks via Wi-Fi in addition to capabilities like a microcontroller as a "brain" and controller in the world of embedded electronics. This module is made by Espressif System, a manufacturer from China. As a newcomer in 2014, with its first product ESP-01. This product immediately attracted attention in the world of embedded electronics because of its ability to allow microcontrollers to connect to Wifi networks as simple as using AT-Command commands. Even though at the beginning of its appearance, the documentation was made in Chinese, but over time, many users have translated it into various languages so that its use is no longer as difficult as before.

Figure 2 Esp8266-01

2.5 Ultrasonic Sensors

The HC-SR04 is an ultrasonic sensor that can read a distance of approximately 2 cm to 4 meters. This sensor is very easy to use on a microcontroller because it uses four pins on the sensor, namely two power supply pins for ultrasonic sensors and two trigger and echo pins as input and output data from sensors to Arduino.

Ultrasonic sensors work by emitting ultrasonic sound waves for a moment and then producing an output in the form of a pulse that corresponds to the reflection time

of the emitted ultrasonic sound waves for a moment then returning to the sensor.

Figure 3 Ultrasonic Sensors

3. Results and Discussion

3.1 Hardware and software design

Shrimp cultivation research has two designs, namely hardware design and software design, while the details of the design are as follows:

1. Hardware Design

Hardware design consists of arduino, ultrasonic sensor, ESP8266,

2. Software Design

Software design uses the Arduino Idea application to run programs on Arduino.

3.2 Activity plan

1. Doing practice introducing Arduino to students. The team made a presentation in front of the class. Then the Team explained in detail about what Arduino is. Explain how the function and workings of Arduino to students. The practice will be carried out at SMA Negeri 1 Brebes.

2. Doing practice independently. After seeing the instructions and explanations from the moderator, the students practiced independently with the equipment that had been prepared by the team. From that practice they will know how the Arduino system works. The training conducted by the Team will make students develop their own system.

3.3 Strategy

There is 1 strategy used in community service, namely conducting training to introduce the Arduino system to students of SMA Negeri 1 Brebes. It is known that the problem is that SMA Negeri 1 Brebes students want to develop an Internet of Things (IOT) based system using Arduino in the school environment, but they do not know how the Arduino system functions and works. Therefore we introduce students to the functions and workings of Arduino so that after knowing how it works they can make Arduino-based products for school progress.

3.4 Schedule of activities

Table 1. Schedule of activities

No	Type of activity	March				April			
		1	2	3	4	1	2	3	4
1	Training Preparation	■							

2	Instrument Arrangement		■	■					
3	Implementation of Training				■	■			
4	Evaluation of training results					■	■		
5	Report writing						■	■	■

4. Conclusion

The conclusion of this dedication is that at SMA Negeri 1 Brebes, they still don't know Audrino well. we introduce arduino so that they can be more creative in the next competition. There are many benefits that can be taken in Arduino students, for example making attendance using face sensors, trash cans using an automatic open lid system using sensors.

Ucapan Terima Kasih

The researcher has compiled the Service Results Report to the best of his ability, however there may be deficiencies that we are not aware of, please provide constructive input and suggestions. Thank You

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