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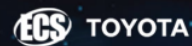
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Automatic Spray Desinfectant Chicken With Android Based On Arduino Uno

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Abstract. Technology plays a very important role in human life. Many devices and applications are created to facilitate human work. In the world of chicken farming many problems are found both in terms of objects and their management. In chicken farms, problems often arise about the decline in the quality of livestock due to disease attacks. Diseases in chicken farms arise due to poor chicken coop conditions and lack of attention from the management. To maintain the condition of the chicken coop remains sterile from disease attacks, then spraying disinfectant chemicals. Disinfectant chemicals are classified as dangerous when exposed to the human body directly. Automatic chicken cage disinfectant spray with Android-based arduino UNO aims to simplify and provide a sense of security when spraying disinfectant for farmers. The process of spraying disinfectant can be done remotely using an Android smart phone application and Arduino Uno microcontroller hardware with Bluetooth communication. HC-05 bluetooth module as a communication medium between Android smart phone with arduino Uno, diarfaghma 12 vdc pump, 80 psi as spray disinfectant while disinfectant spray drive uses 5 vdc motor. Automatic chicken cage disinfectant spray can be done at a maximum distance of 10 meters.

Keywords: Android, Arduino Uno, Automatic Spray, Disinfectant Spray.

1 Introduction

Technology plays a very important role in human life. As technology develops, problems can be easily solved. Humans develop technology from the vital side of the problem at hand. Until now there are still many sectors that are not even considered to be touched by technological developments, one of which is the chicken breeding sector. In the world of chicken farming many problems are found both from the object and its management. In chicken farms, problems often arise about the declining quality of livestock due to disease attacks. Disease in chicken farms arises because of the poor condition of the chicken coop and the lack of attention from its managers. To keep the chicken coop clean and sterile from disease, spraying disinfectant chemicals is used to eradicate microbes (viruses, bacteria, fungi) and insects. Spraying is done when the chicken coop is empty to work effectively and efficiently. Disinfecting material for good spraying is an alcohol content with a content of 75%. Because the alcohol smells very strong, then spraying must be equipped with protective equipment. After finishing spraying alcohol, the officer must be given 2 cups of high calcium milk a day for 3 days in order to eliminate toxic substances from alcohol in the body. The danger of alcohol chemicals sprayed on the chicken coop when directly exposed to the human body, therefore a disinfecting spray



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gun for chickens that is safe and efficient is needed. With the description above, I plan to make an automatic disinfectant spray chicken coop with an Android-based Arduino Uno. The working system of this tool is an android mobile phone used as a remote control to turn on and turn off the device via the HC-05 Bluetooth communication module, then the communication is forwarded to Arduino Uno as an alcohol pump control device and a disinfecting spray drive motor. By spraying disinfectant chicken coop from a distance is expected to reduce the risk of poisoning due to disinfection alcohol alcohol chemicals and facilitate the work of officers.

2 Methodology

2.1 Current system

In the work system In the working system spray disinfectant chicken coops currently use a manual sprayer. Disinfecting liquid in the tank is sprayed on the chicken coop by pumping the tank manually using hands and the sprayer directed at the object. The description of the old system is explained in Figure 1.

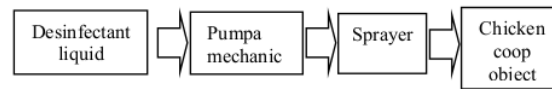


Fig. 1. Current Diagam Block System

Development of disinfecting disinfection of chicken coops further by using an automatic spray disinfecting spray tool for chicken coops remotely controlled using an Android Smartphone. In the development of this disinfecting spray automation system. The pump and DC motor are controlled by Android smartphones and Arduino UNO as data processing via Bluetooth HC-05 communication. If the android smartphone gives an order to HC-05. Then Arduino will process the data received from HC-05 to run the d[is]infecting spray automation system that has been programmed in the Arduino sketch. Furthermore Arduino sends a low signal to the low trigger relay module to run the pump motor disinfectant. After the pump is disabled and works according to the time specified in the sketch programming, Arduino gives a signal / command to the L298N motor drive as a DC motor turn right / left alternately. The development system is explained in Figure 2.

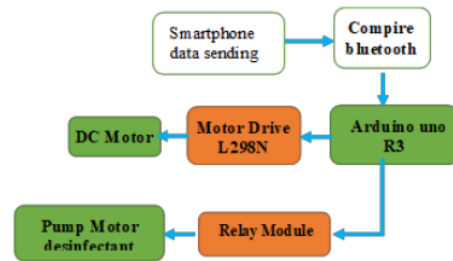


Fig. 2. System Development Diagram Block

2.2. Designing an Android control automatic spray disinfecting chicken coop application with the Mit Inventore app

Mit Inventor app is an online software to create a simple Android application as desired. To create an Android application the first step is to visit a website <http://ai2.appinventor.mit.edu>. Then log in using email, wait until the desktop app Mit software inventor then design and install the button. The second step into the sheet block for programming from the button that has been installed. Click build app. The last step transfer to an android smartphone via QR code and the application is ready installed on an android smartphone. The design of button and sheet block design can be seen in Figure 3. and Figure 4.

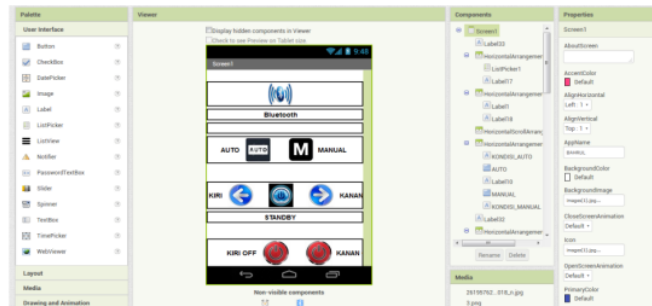


Fig. 3. Sheet designer from MIT App Inventor software

In Figure 3 you can see the buttons have been installed. The auto button to run the program automatically and the manual button to run manually while the standby button to turn off automatically. Right and left direction buttons to move spray according to the directional keys that press. Left button off to turn off the spray movement to the left and right button off to turn off spray movement to the right.



Fig. 4. Sheet Block from Software MIT App Inventor

In Figure 4, the sheet block has been dragged and dropped from the box block collection box on the left. In the selection of the sheet block is adjusted to the buttons that have been installed in the sheet designer in Figure 3.3 and is attempted sequentially in selecting it in accordance with the order of the sheet designer. Starting with sheet block of the bluetooth button that will be paired (connected), sheet block clock to set the time of connecting the bluetooth that is around. Then the sheet button to activate the button that is around. Then the sheet button to activate the button that will control the device, variable use of the button is adjusted to each other's desires.

3 Result and Discussion

In this chapter discusses the test planning of the tools made. Testing is done to find out how it works and know the results in accordance with the plan. Data retrieval testing is carried out in each section and as a whole. In testing carried out directly with an android application that has been made and installed on four different Android smartphones of different types and brands. Automatic testing of disinfecting spray chicken coop with an arduino uno-based android is done with test the control of disinfecting spray with android at a maximum distance of 8 meters. Every meter is assessed whether or not the automation tool for spray disinfecting spray chicken coops is done.

3.1. Mechanical Circuit Design

In the form of mechanical construction using the basic material of a wooden harboard box as a chicken coop and wooden beams as a path for disinfecting spray motor, where the size is determined and arranged in such a way that it becomes a chicken coop with a size of 50x30x40 cm as shown in figure 5.



Fig.5. Mechanical Structure of Chicken Cage Box

3.2. Testing the Bluetooth Module HC-05.

Testing the HC-05 bluetooth module to determine the connectivity between the bluetooth smartphone android network with the Bluetooth HC-05. The steps in testing the HC-05 bluetooth module are as follows:

1. Connect the HC-05 bluetooth module to the pin specified on the arduino by using a female to female cable.
2. Connect the Arduino Module to the computer using a female to female cable.
3. Next, activate the computer and run the Arduino program that was created.
4. Setting Arduino port on the computer.
5. Upload the program used to compire the Bluetooth module with an Android smartphone.
6. Activate Bluetooth android smartphone and open the application that has been made and compiled it
7. Observe and compare the results of the trial, whether it matches the desired results.

From the results of testing the connectivity between the android smartphone bluetooth network with bluetooth HC-05 shown in Figure 6



Fig.6. Testing of Bluetooth HC-05

The results of testing the bluetooth smartphone network connectivity with Android and Bluetooth HC-05 modules on different types and brands of Android smartphones are shown in Table 1.

Table 1 Testing Results of Bluetooth Module HC-05

No.	Brand and type smartphone android	Compire bluetooth (Was successful /No)	Average Test Results	Percentage of success
1.	Xiaomi mi 4C	1	1	100%
2.	Xiaomi redmi note 5 A	1	1	100%
3.	Oppo A83	1	1	100%
4.	Samsung J2 prime	1	1	100%

Information on Table 1:

1 = Bluetooth Compire success was successful

0 = Bluetooth Compire did not work

So to look for the average value of the results of testing the bluetooth network connectivity android smartphones with Bluetooth module HC-05 on different types and brands of android smartphones get the following formula:

$$\text{Average} = \frac{\text{amount of testing data}}{\text{abundance of test data}}$$

$$\frac{1+1+1+1}{4} = \frac{4}{4} = 1$$

So to find the percentage of success of the android smartphone bluetooth network connectivity test results with the Bluetooth HC-05 module on different types and brands of android smartphones, get the following formula:

$$\text{percentage of succes} = \frac{\text{Test result}}{\text{Testing average}} \times 100 \%$$

$$\frac{1}{1} \times 100\% = 100\%$$

From the data table test results of bluetooth smartphone android network connectivity with Bluetooth module HC-05 on different types and brands of android smartphones. Compire bluetooth smartphone network android with Bluetooth module HC-05 successfully working properly as desired

3.3. Automatic Testing Results for Disinfecting Spray Chicken Coop With Android Based on Arduino Uno

Testing the results of automatic spray disinfectant chicken coops with an Arduino Uno-based Android aims to ensure the entire range works normally as expected.

The steps in Testing the results of automatic spray disinfectant chicken coops with an Arduino-based Android are as follows:

1. Connect an Android smartphone with a Bluetooth module with a predetermined code.
2. Connect the Arduino Module to the computer using a female to female cable.
3. Connecting the L298N motor driver module, the 5vdc relay module on the pin specified on Arduino using a female to female cable.
4. Next, activate the computer and run the Arduino program that was created.
5. Setting Arduino port on the computer.
6. Upload the program used to run the automatic disinfectant spray that has been created.
7. Open the Android smartphone application that has been created.
8. Observe and compare the results of trials, whether according to the desired results.

The form of the results of automated testing of disinfecting spray chicken coops with Android based on Arduino Uno is shown in Table 2.

Table 2. Results of Automatic Spray Test Disinfecting Chicken Coops With Android Based on Arduino Uno

No.	Distance	Motor rotates		LED Lamp (On/Off)	Diaphragm pump spinning (Yes/No)	Average Results Testing
		Right	Left			
1.	2	1	1	1	1	1
2.	4	1	1	1	1	1
3.	6	1	1	1	1	1
4.	8	1	1	1	1	1
5.	10	1	1	1	1	1

From the data table the results of automatic testing spray disinfecting chicken coops with Arduino UNO-based Android. The whole series of automatic spray disinfecting chicken coops with Arduino UNO-based Android can work correctly in accordance with the program created.

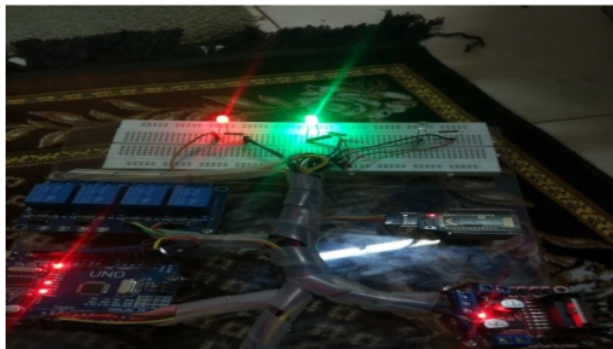


Fig. 7. Automatic Testing Series of Disinfecting Spray Chicken Coops With Android Based on Arduino Uno

4 Conclusion

From each stage that has been carried out in the test, conclusions can be drawn.

1. By using hardware in the form of a microcontroller circuit (Arduino Uno) and an Android application to control disinfecting spray automatically and can work at a maximum distance of 10 meters through Bluetooth communication.
2. Testing is done directly with using the HC-05 bluetooth module as an android smartphone communication media with arduino uno and a 12 vdc diaphragm pump, 80psi as a disinfecting spray while the spray drive motor using a 5V DC motor works successfully in accordance with the program that has been created, so as to simplify and provide security to farmers when spraying disinfectant on the chicken coop.

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