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Implementation of Duck Egg Hatcher System and Web-Based Monitoring

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ABSTRACT

Writing this research aims for Web-based egg incubators are tools or machines used to hatch poultry eggs such as ducks and the like, with temperature regulation using NodeMCU ESP 8266 as the control center, DHT11 sensor as temperature sensor, LCD as its appearance, lights and fans. NodeMCU ESP 8266 has an input in the form of a temperature sensor, this sensor will detect 2 temperatures in the incubator and display it on the LCD. This egg incubator uses a fan that functions as a cooler by removing heat in the incubator space and a lamp that functions as a heater, so the incubator will work automatically. How to design and implement a web-based set of duck egg hatching tools and how to display the egg incubator temperature and humidity information on a web connected to an egg incubator suite. By conducting 4 stages of research (i) Analysis of How the System Works and Analysis of Needs (ii) Design Hardware Design, Schematic Design, Database Design, WEB Design, Network Design (iii) Hardware Implementation and Software Implementation (iv) Testing. The results of this research are in the form of designing a duck egg incubator system and web-based monitoring including (i) DHT 11 Sensor Function Testing, Relay Function Testing, WEB Testing. Sensor and WEB testing are in accordance with their functions. The next test is to use the Blackbox on the implementation of the Duck Egg Performance system and Web-Based Monitoring. In this test it is in accordance with its function.

1. Introduction

With the development of the times, there are many technological tools to facilitate human work in any field. So that many technological tools are now being used, for example, egg incubators based on microcontrollers and many more. The raising of ducks in Indonesia is generally still traditional so that the production is quite low. Intensive maintenance of ducks must be supported by the provision of seeds continuously and in large quantities. In the field of livestock, especially in duck farming, the problem faced is how to hatch large numbers of duck eggs, because the ability of duck mothers to incubate their eggs is limited. So to replace the mother duck in hatching eggs in large numbers, a Web-based automatic duck egg incubator was created.

Web-based egg incubators are tools or machines used to incubate poultry eggs such as ducks and the like, with temperature regulation using NodeMCU ESP 8266 as the control center, DHT11 sensor as temperature sensor, LCD as display, Lights and Fans. NodeMCU ESP 8266 has an input in the form of a temperature sensor, this sensor will detect 2 temperatures in the incubator and display it on the LCD. This egg incubator uses a fan that functions as a cooler by removing heat in the incubator space and a lamp that functions as a heater, so the incubator will work automatically. The formulation of the problem in this research are (1) How to design and implement a series of web-based tools to hatch duck eggs. (2) How to display incubator temperature and humidity information on a web connected to an egg incubator series. Based on the formulation of the problem, the objectives of this study are: (1) Design and implement a duck egg incubator system and web-based monitoring, (2) Can display information on temperature and humidity of the incubator on the web.

2. Research Method

This research method is a framework for carrying out an action or a frame of mind to formulate an idea that is directed and related to the aims and objectives. The method used in this research is as shown in the following figure, which is an explanation of the stages in the research or framework:

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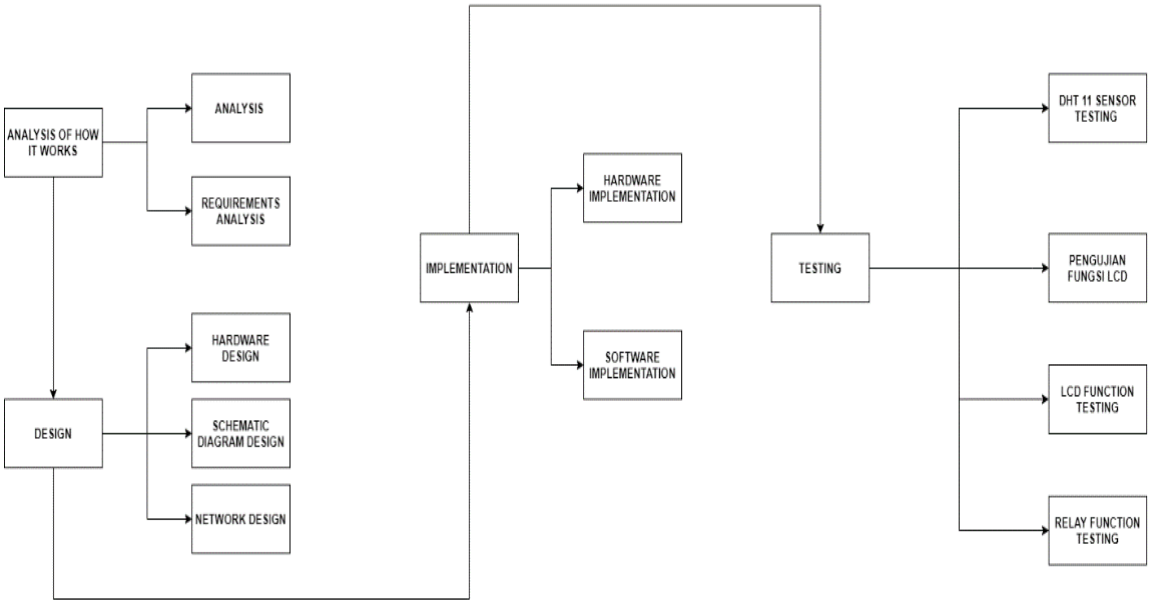

Fig 1. Research Method

3. Result

3.1 Analysis of how it works

In the process of analyzing how it works, it will explain how the system works in this study. The following image will explain the analysis of how this system works:

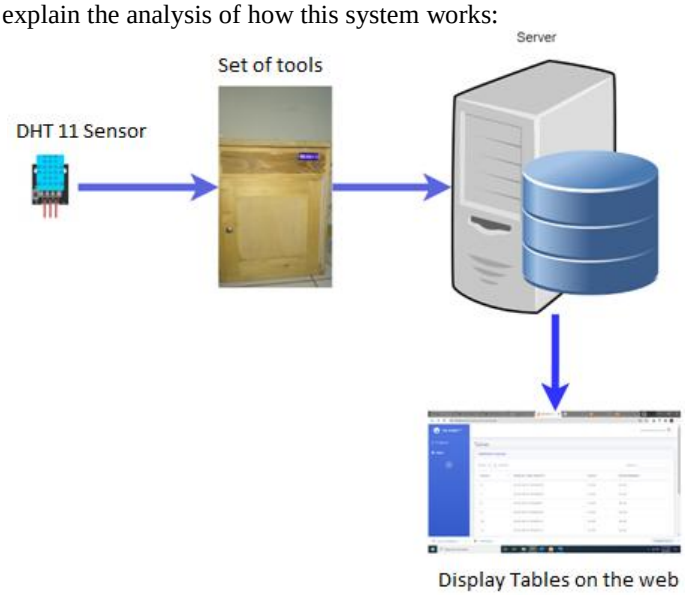

Fig 2. Analysis of how it works

Figure 2 explains how the system works in this study starting with Sonsor DHT11 which received data in the form of temperature and humidity. The temperature and humidity that have been obtained are sent to a series of duck egg incubators, then display the LCD in the form of temperature and humidity that is in the set of duck egg incubators which are then sent to the server which then displays the data can be viewed by the web in the form of a temperature time table humidity.

3.2 Schematic diagram design

The device used in the schematic diagram of the whole system is as shown in Figure 3 Shows the circuit is divided into 3 stages, namely (1) DHT11 and NodeMCU ESP8266 schematic diagrams and stage (2) NodeMCU ESP8266 schematic diagrams with LCD stage (3) NodeMCU The ESP8266 with Relay controls lights and fans.

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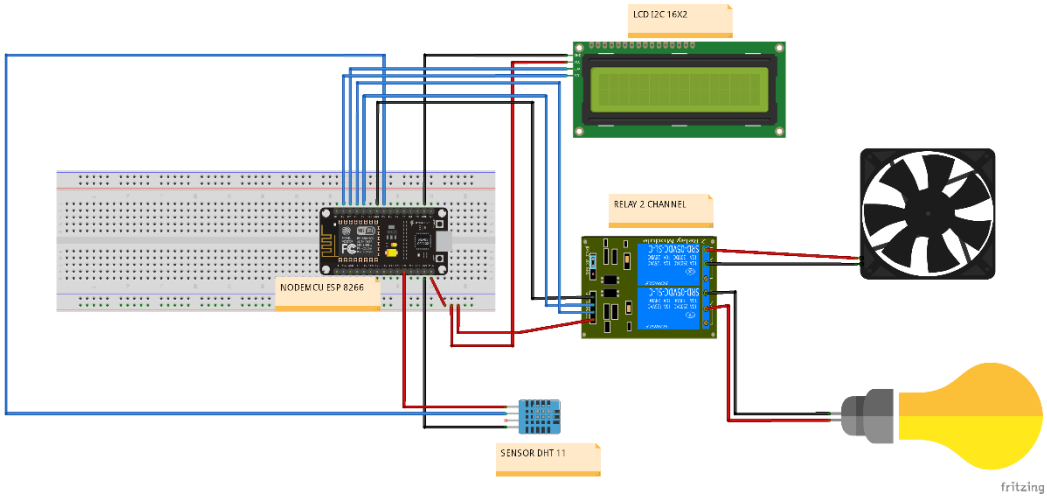

Fig 3. Schematic diagram design

3.3. Implementation

At the implementation stage, it is realizing everything that has been planned and designed in the system.The following are the implementation stages that will be carried out using a flowchart as follows.

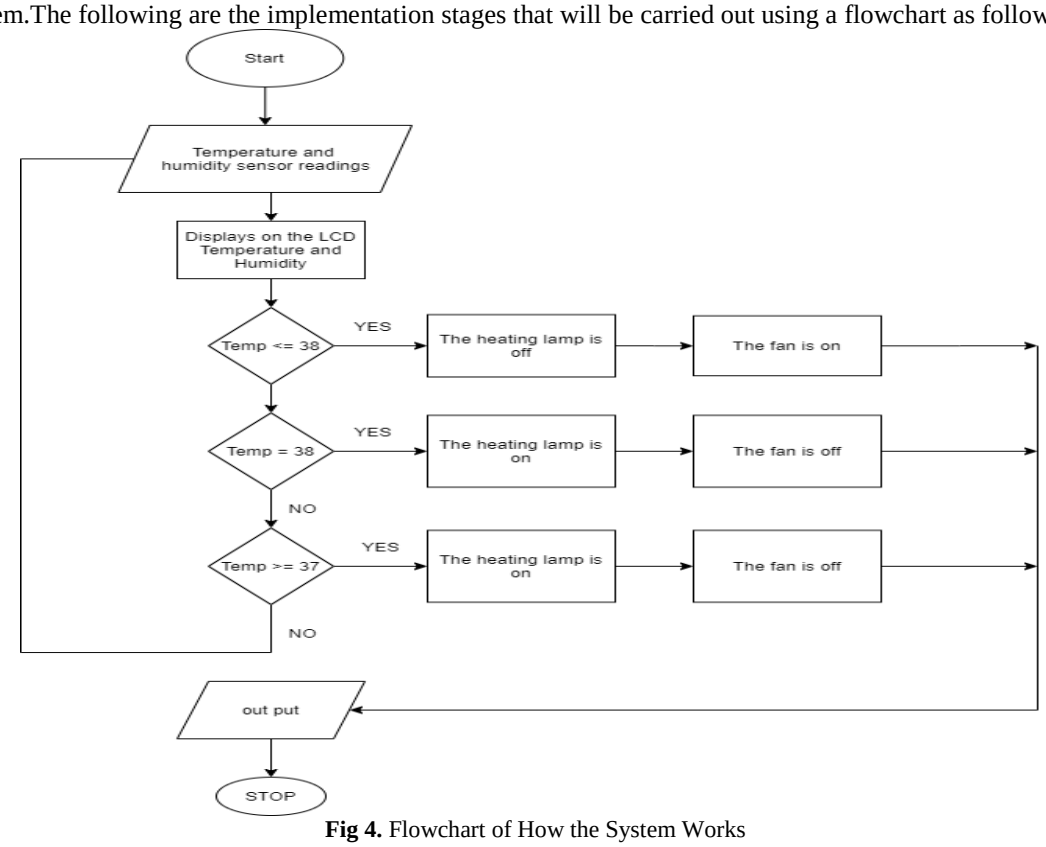

Fig 4. Flowchart of How the System Works

3.4 Testing

This stage is to conduct web testing using a black box. Black box testing is carried out on the web page so that the resulting web is as expected and valid. The following is black box testing with Equivalence Partitioning which will get results in the form of a web that matches expectations and is valid.

Table 1
Time temperature and humidity

No	Test Name	Expected results	Results obtaine	Information
1.	Displays date and time on the web.	Time data appear on web pages in realtime.	corresponding	Valid
2.	Displays	The temperature data appears on the web page.	corresponding	Valid

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No	Test Name	Expected results	Results obtaine	Information
3.	Temperature on the web. Displays humidity data on the web.	The temperature data appears on the web page	corresponding	Valid

Based on Table 1, it is a black box test on the main page. From this test, the results are obtained, namely the main page as expected and successful.

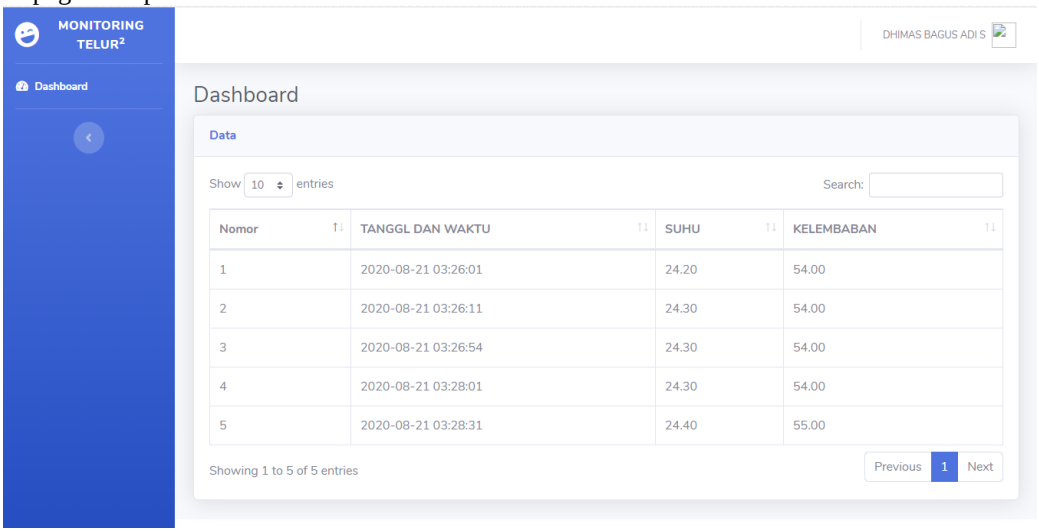

Fig 5. WEB testing using Black Box

4. Conclusion

Based on the discussion of the results of this study, the following conclusions were obtained: (1) A design for the implementation of a duck egg incubator and web-based monitoring has been made, it can display information on temperature and humidity values and can display text on the LCD. (2) The monitoring results obtained by datalog are temperature data, humidity data is stored every 60 minutes

5. References

[1] Akhmad Fahruzi, A. S. (2019). Implementasi Kontrol PID Pada Mesin Penetas Telur Burung Murai. Jurnal Ilmiah Bidang Teknologi Informasi dan Komunikasi.
[2] Deny Nusyirwan, M. F. (2019). Perancangan Purwarupa Pengatur Suhu Otomatis pada Inkubator. JAST : Jurnal Aplikasi Sains dan Teknologi, 3 (1), 2019, page 60-72.
[3] Dhanny Jufril1, D. (17 November 2015). IMPLEMENTASI MESIN PENETAS TELUR AYAM OTOMATIS. ISSN : 2407 – 1846.
[4] Dhanny Jufril1, D. R. (17 November 2015). IMPLEMENTASI MESIN PENETAS TELUR AYAM OTOMATIS. ISSN : 2407 – 1846.
[5] ERWIN FADHILA, H. H. (2014). Pengendalian Suhu Berbasis Mikrokontroler. Jurnal Reka Elkomika.
[6] Erwin Harahap, F. H. (November 2007). FAKTOR PENGHAMBAT TRANSMISI DATA PADA JARINGAN TCP/IP. Jurnal Matematika UNISBA, 1.
[7] Ritzkal, A.G., Keny Aldiansyah Mohammad Aziz, Andik Eko Kristus Pramuko, Ade Hendri Hendrawan, 2017. Implementasi Sistem Kontrol Berbasis Mikrokontroler Arduino Uno R3 Untuk Sistem Penetasan Telur Ayam. Semin. Nas. Inov. Dan Apl. Teknol. Ind. 2017 B53.1-B53.10.
[8] Ritzkal. 2020. "Tick Waste Application in Houses With Warning of Microcontroller Assistant Social Media.," Jurnal MANTIK Vol 3, hlm. 559-568.
[9] Ritzkal. 2018. "Manajemen jaringan untuk pemula.," Bogor: UIKA PRESS.
[10] M Subchan, Dedi Setiadi. 2020. "Information System For Sale Of Muslim Clothes Based On E-Commerce Technology.," Jurnal MANTIK Vol 4, hlm. 311-318.
[11] Ritzkal, Arief Goeritno, dan Eko Hadi P, (2017), "Pengukuran Kualitas Perangkat Lunak Sistem E-Learning Menggunakan Metric Function Oriented", Prosiding SNATIF Ke-4 Fakultas Teknik Universitas Muria, Kudus.
[12] Ritzkal, Moh Subchan, (2017), "Pengukuran Kualitas Perangkat Lunak Sistem Manajemen Pelaporan Kegiatan Berbasis Web Peringatan Berbasis Email",Prosiding Seminar Nasional Teknoka ke - 2 UHAMKA, Jakarta.
[13] Ritzkal. 2019. Keamanan Jaringan Cyber. Bogor: UIKA Press

Accredited "Rank 4"(Sinta 4), DIKTI, No. 36/E/KPT/2019, December 13th 2019.