UNIVERSITI TEKNIKAL MALAYSIA MELAKA

DEVELOPMENT OF EGG INCUBATOR WITH FUZZY LOGIC CONTROLLER BY USING MICROCONTROLLER

This report is submitted in accordance with the requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor of Electrical Engineering Technology (Industrial Power) with Honours.

by

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APPROVAL

This report is submitted to the Faculty of Mechanical and Manufacturing Engineering Technology of Universiti Teknikal Malaysia Melaka (UTeM) as a partial fulfilment of the requirements for the degree of Bachelor of Electrical Engineering Technology (Industrial Power) with Honours. The member of the supervisory is as follow:

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ABSTRAK

Sistem pegeraman telur direka bagi tujuan meningkatan pengeluaran jenis unggas. Jumlah telur yang mampu untuk ditetaskan secara manual memalui induk agak kecil jumlahnya. Perkara ini berlaku disebabkan faktor cuaca yang tidak menentu dan juga disebabkan baka induk itu sendiri yang kurang baik dari segi penjagaan telur ketika mengeram. Justeru itu, inkubator ini berfugsi untuk meningatkan sedikit sebanyak kadar penetasan telur. Sistem pengeraman ini mangawal suhu di dalam peti pengeraman secara automatik dengan mengunakan system kawalan arduino. Selain itu, sistem pengeraman ini juga mampu dipantau secara berkala dari segi suhu dan kelembapan mengunakan LCD yang disediakan. Hal ini kerana, suhu dan juga kelembapan amat penting dalam memastikan proses pengeraman ini berjaya.

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ABSTRACT

The incubator system is designed for the purpose of increasing the production of poultry types. The number of eggs that can be hatched manually through the hen is smaller. This is due to the uncertain whether factor and also due to the lack of good nutrition in terms of egg care during incubation. Hence, this incubator is work to improve a little bit the rate of egg hatch. This incubation system regulates the temperature in the incubation box automatically by using an Arduino control system. In addition, this incubation system can also be monitored periodically in terms of temperature and humidity using LCD provided. This is because temperature and humidity are very important in ensuring the incubation process is successful.

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DEDICATION

This project is dedicated to my parent Mr. Hasanar Kunju bin Muhammed Kunju and Mrs. Safurah Binti Omar, who taught me that the best kind of knowledge to have is that which is learned for its own sake. It is also dedicated and appreciation my supervisor, Mr. Ab Wafi Bin Ab Aziz who taught me that even the largest task can be accomplished if it is done one step at a time and for advising and helping through this project.

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LIST OF SYMBOLS

	-	Degree Celsius
%	-	Percent
W	-	Watt

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CHAPTER 1

INTRODUCTION

1.1 Background

Farming is a very important job sector for the community, especially in rural areas today. Farming sector is also one of the contributors to the country's progress. There are a number of programs and equipment, tools, and other assistance provided to ensure that the livestock sector continues to grow from time to time. Among the most popular projects are hatchery or "Incubator" projects. Which is about year 2010, billions of eggs and nearly 3 million chickens are marketed for community needs. Thus, most suppliers are working to provide livestock products to meet the needs of consumers.

There are several technologies used to assist breeders in fulfilment the needs of consumers. My project it was an incubator project where this project helped systematically incubate eggs. The technique of incubation is a bit as it helps the process of poultry chicken farming than normal incubation techniques. This project uses electronic components as a control system to ensure that this incubator works properly.

The construction of this project structure is using the plastic box completely. In this project, the microcontroller is used to control the temperature and heating produced by the heating coil. The control system used in this incubator project is Arduino. There are also sensors used in this incubator project, which is a temperature sensor in which this

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temperature sensor is used to ensure the temperature in the incubator container is always 37 C - 40 C. In addition, humidity sensors are also used in this incubator to ensure that egg hatching process can be performed properly.

Another thing that needs to be done to complete this incubator project is the ventilation system. The ventilation system is necessary to ensure that oxygen in the incubator is always present and the temperature in the incubator box is not too hot. Egg rotation manually should be performed to ensure the embryo in the egg does not stick to egg shell wall. All the things that are mentioned are very important to ensure that this incubator can be used effectively.

The project aims to design an egg incubator system as well as an incubation system which is capable of automatically controlling temperature and humidity. In addition, this incubator project can also be regulated in terms of increasing or decreasing temperature and humidity by monitoring from LCD provided.

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1.2 Problem Statement

This incubator system has been widely used, especially in poultry farmers. This acquaintance helps the chicken entrepreneur to ensure the supply of chickens reach the target and meet the demand of sellers and buyers. The incubator is used to replace the egg hatching system manually, that is need the hen to hatch eggs. That way it's hard to get a chick with a lot of quantities. This is because of the relatively poor weather and environment factors causing the incubation process to be somewhat disturbed. With the existence of this incubator, the production of chicken can be increased.

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1.3 Objectives

There are several objectives of making this incubator implemented:

a) To develop egg incubator by using microcontroller.

b) To monitor the temperature in incubator.

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1.4 Scopes

The scope of this project is to achieve the objectives. The development of the project is involving the use of software and hardware. For complete this project must follow this scope.

a) This project focuses on building an egg incubator in a small size allowing 30 eggs can be incubated once.

b) The type of egg is chicken.

c) Controls the temperature in the incubator to ensure the temperature is within 37 C - 40 C.

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CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The first step in this project approach was the literature review. It involved searching the Internet for information for this project, ask people and reading articles. Based on the collected information, a few methods and tests that would be used to implement in this project. Different methods in which the project could be implement in this project.

2.2 Overview Egg Incubator

These days, more critical horticulture and animals cultivating for instance of the field keeps on developing with assist advances improvements. More advances were making to additionally build up the field. For accomplish this objective, the venture is made with effective, snappy and simple to work. Task is "Brilliant Hatchery" that fills in as chicken egg brooding more precise. With the utilization of this Hatchery bring forth eggs are more fruitful when contrasted and brooding physically. This venture will make more cantered around controlling an electronic framework that utilizations more electronic segments to empower it to work.

The primary motivation behind this venture is planned with the goal that the bring forth eggs were more effective than the brooding physically. The development of

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this undertaking is utilized right around 95% of wood as the principle fixing(Ramli, Lim, Wahab, & Zin, 2015). In the activities, microcontroller programming connected to control temperature and warmer made by lighting. This microchip is associated with the transfer circuit with the goal that it can control the knobs and fans naturally. Moreover, to figure the quantity of days that had been determined to the circuit chip.

On the off chance that the temperature is provided more than 37°C-38°C and it can be distinguished by an advanced temperature sensor circuit, while the transfer circuit will kill the globules in 5 minutes to diminish the temperature inside the hatchery(Adegbulugbe, Atere, & Fasanmi, 2015). On the off chance that the temperature is under 37C, the temperature will be set back by the tally all over switch. The task requires a temperature of around 37°C to 38°C to guarantee that the hatching of the eggs was all the more equally with the goal that the outcome got are of better quality. Egg brooding takes around 20 days before he was exchanged to the incubation centre.

2.3 Heating System for Incubator

The incubator is divided into two heating methods used. Among the methods used is the use of bulbs and also heating rods(Kesarwani, Pranav, Noah, & Kavitha, 2016). These two methods are used to ensure that the temperature in this incubator room reaches the ideal temperature for the egg incubation system.

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