UNIVERSITI TEKNIKAL MALAYSIA MELAKA

DEVELOPMENT OF DRAIN CLEANER

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

by

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2020

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

BORANG PENGESAHAN STATUS LAPORAN PROJEK SARJANA MUDA

Tajuk: **DEVELOPMENT OF DRAIN CLEANER**

Sesi Pengajian: 2019

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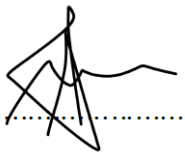

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DECLARATION

I hereby, declared this report entitled Development of Drain Cleaner is the results of my own research except as cited in references.

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Date : 19 January 2021

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 Mechanical Engineering Technology (Industrial Automation & Robotics) with Honours. The member of the supervisory is as follow:

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Supervisor : En. Arman Hadi Bin Azahar

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Co-supervisor: En. Johar Akbar Bin Mohamat Gani

ABSTRAK

Tujuan utama penghasilan mesin pembersihan longkang menggunakan mikropengawal Arduino adalah untuk membantu manusia membersihkan kawasan longkang yang tidak mampu dicapai oleh mereka. Fokus utama projek ini adalah untuk mengelakkan pembiakan serangga seperti nyamuk dan lalat di kawasan persekitaran perumahan, khususnya di longkang dan saliran air. Dengan pelaksanaan projek ini, mesin yang terhasil dapat meningkatkan kualiti dan tahap kebersihan longkang di sekitar kawasan perumahan dan mencegah daripadanya berlakunya pembiakan nyamuk dan kes denggi amnya. Data yang diambil daripada operasi projek prototaip dan keberhasilan experimen yang dijalankan ke atasnya kemudiannya direkod, dianalisis dan dinilai untuk tujuan penambahbaikan.

ABSTRACT

The main purpose of the production of sewage cleaning machines using the Arduino microprocessor is to help people clean up areas that they cannot afford. The main focus of the project is to prevent the breeding of insects such as mosquitoes and flies in residential areas, especially in drains and drainage. With the implementation of this project, the resulting machines can improve the quality and level of drainage around the housing area and prevent the occurrence of mosquito breeding and dengue cases in general. The data obtained from the prototype project's operations and the success of the experiments conducted on it were then recorded, analysed and evaluated for improvement purposes.

DEDICATION

I acknowledge my sincere dedication, honours and gratitude to both of my parents for their love, encouragement, support, and sacrifices encouragement, push for tenacity ring in my ears and throughout my life. Without their sacrifices and encouragement, I cannot possibly reach this stage. Special gratitude is also dedicated to all my brothers and sisters who always support and advise me in whatever I. Special thanks also goes to all of the lecturers who have taught and guided me throughout my degree study. Not to be forgotten, all of my friends and colleagues who have always been with me throughout this challenging journey. There are no words that can be expressed but my sincere appreciation and best wishes to all of the parties mentioned above.

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LIST OF SYMBOLS

D, d	-	Diameter
F	-	Force
g	-	Gravity = 9.81 m/s
I	-	Moment of inertia
1	-	Length
m	-	Mass
N	-	Rotational velocity
P	-	Pressure
Q	-	Volumetric flow-rate
r	-	Radius
T	-	Torque
Re	-	Reynold number
V	-	Velocity
w	-	Angular velocity
x	-	Displacement
z	-	Height

LIST OF ABBREVIATIONS

LCD	Liquid crystal display
IDE	Integrated development environment
DIY	Do-it-yourself
GPS	Global positioning system

LIST OF PUBLICATIONS

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter will address the context of the project, the problem statement, the goals, the complexity and limitation of the project.

1.2 Project Background

In today's world, Cleanliness is an important aspect that needs to be emphasized by all individuals of all ages. Whether such hygiene is related to the purity of the environment, habitat, food and physical members, as well as the spirituality of the soul; it must be guarded against all elements that may damage it or pollute it. Abandonment of the hygiene aspect can be harmful if it continues.

However, as noted, waste consisting of food waste, including food and beverage packaging materials, is the most common form of waste. This type of waste, if left untreated, will cause the environment to smell bad and will also attract mice and flies that are carriers of the disease. Disposable products are mostly made up of containers capable of storing water and producing mosquito breeding grounds, as a result of which the drain is not kept clean.

A disease caused by germs that spread out of the sewage if it is not properly disposed of or if people do not conduct proper cleaning. Unless the drainage system is not managed properly, the waste cannot be disposed of safely. In order for the

sewage system to be properly maintained, all sewer problems must be fixed as soon as possible after they have stopped working as intended.

Misuse and lack of maintenance are the two main reasons why drainage structures (road drainage ditches, culverts, dam site drainage or drainage canals in irrigation schemes, and also drainage water treatment and disposal facilities) are often associated with environmental health problems (*Martin S. Fritsch,Swiss Federal Institute of Technology, Zurich, Switzerland*).

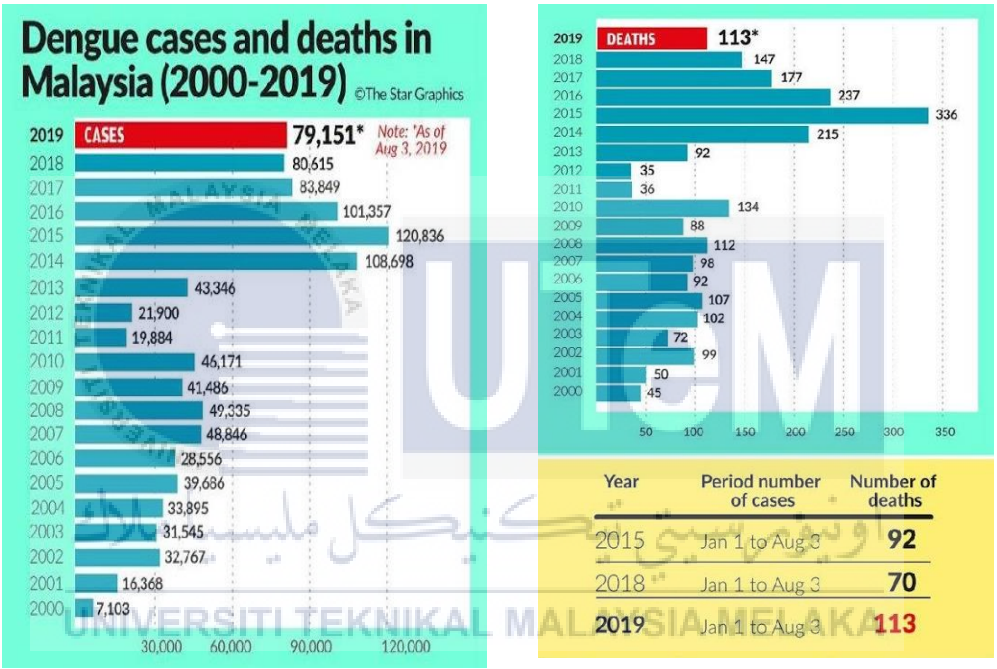

Figure 1. 1 Data of Dengue Cases and death is Malaysia (2000-2019)

World Health Organisation report on Dengue Situation (Update Number 572 dated July 4) showed that Malaysia was not the only country which experienced an increase in dengue cases as neighbouring countries such as Singapore, the Philippines, Taiwan, Vietnam, Cambodia, Laos and China had it too (The Straits Times , 2019) .Deputy Health Minister Lee Boon Chye expects the number to hit 150, 000 cases by year end if all out efforts are not taken to keep it under control. (LOH FOON FONG,

2019)Dengue is increasing in many parts of the world even in Singapore. Cuba eradicated it once, but it has re-emerged. Southern China, southern Taiwan and southern Japan also have reported cases. “As air travel becomes common, the virus spreads,” he said. (LOH FOON FONG, 2019)The Cases from the dengue’s

Figure 1. 2 Contract worker cleaning the drain.

One of the most important areas of the home is one that probably never even thinks about it. The sewage line helps to get rid of the waste and keeps the family safe and comfortable. As a cleaner, sewer repair and drain cleaning contractors will often have years of experience under their belts. This experience will give them the knowledge they need to repair or clean the sewer system properly. Having a professional who works hard to maintain the sewer lines is very important to the overall health of the property. Many homeowners do not have the right equipment to clean or fix a sewage line properly. These specialized tools can be very expensive and investing