UNIVERSITI TEKNIKAL MALAYSIA MELAKA

PADDY PLANTER ROBOT USING ARDUINO

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

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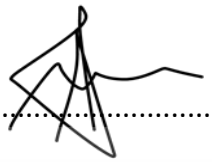

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DECLARATION

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Date: 19 Januari 2021

APPROVAL

This report is submitted to the Faculty Of Electrical And Electronic Engineering Technology of Universiti Teknikal Malaysia Melaka (UTeM) as partial fulfilment of the Bachelor of Electrical Engineering Technology (Industrial Automation & Robotics) with Honours. The member of the supervisory is as follow:

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ABSTRAK

Pertanian berkembang seiring dengan perkembangan teknologi. Perkembangan ini memudahkan aktiviti pertanian. Penanaman padi secara tradisional mempengaruhi jarak penanaman, Dalam penanaman padi, yang dapat mengakibatkan terlalu banyak biji padi terpakai dan memproses penanaman secara historis memakan sebahagian besar keperluan tenaga kerja dan oleh itu penekanan harus diberikan pada mekanisasi operasi ini untuk meminimumkan keperluan tenaga kerja dalam penanaman padi dan boleh mempengaruhi keuntungan dan terdapat pelbagai risiko dalam proses penanaman padi secara tradisional.Pembangunan projek ini adalah untuk mengatasi masalah ini.Selain itu, projek ini adalah untuk meminimumkan kos sewa mesin yang sedia ada kerana kos penyelenggaraan yang tinggi. Projek penanaman padi digunakan dalam bidang penanaman padi menggunakan benih padi. Robot ini menggunakan alat kawalan jauh untuk menggerakkan robot.Apabila motor digerakkan oleh bekas simpanan padi dan tayar bergerak serentak pada masa yang sama biji padi akan keluar dari bekas simpanan. Dalam laporan akhir ini dijelaskan lebih mendalam tentang sistem kerja mesin penanam padi yang dibuat, reka bentuk dan peralatan yang digunakan, dan hasil ujian dari mesin tersebut.

ABSTRACT

Agriculture is evolving with the development of technology. This development facilitates agricultural activities. This paddy planter is used in the field of paddy cultivation using paddy seeds. Rice cultivation has traditionally affected the cultivation distances, in rice cultivation, resulting in too many used paddy seeds and historically cultivation processing consumes most of the labor requirements. Hence, emphasis should be placed on mechanizing these operations to minimize labor requirements in rice cultivation and affect profitability, and In traditional rice cultivation, there are various risks. Development of this project is to overcome this problem. Moreover, this project minimises the cost rental cost of the existing machine due to high maintenance costs. This robot uses a remote control to move the robot. When a paddy storage container drives the motor, and the tires move simultaneously, the paddy seeds will come out of the storage container. In this final report, it is explained in more detail about the working system of the paddy planter machine made, the design and equipment used, and the machine's test results.

DEDICATION

I would like to express my special dedication to people who support me with this thesis. I am grateful and acknowledge that both of my parent and sibling give me encouragement and endless support to me for completing this Bachelor Degree Project (BDP). Without them, I probably not reach this stage. Besides, special thanks for my fellow lecturer for advice, taught, and guidance through my studies. Not forgetting, all of my beloved friends throughout this wonderful journey. Finally, thank you to all people who help me directly or indirectly for the support in completing this project.

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LIST OF SYMBOLS

D, d	-	Distance
cm	-	centimetre
Km/h	-	Kilometres per hour
A	-	Current
V	-	Voltage
m	-	Meter
mm	-	millimetre
N.m	-	Newton.meter
rpm	-	Revolution per minute
DC	-	Direct current
T	-	Torque
MHz	-	MegaHertZ
V	-	Velocity
w	-	Angular velocity
x	-	Displacement
z	-	Height
q	-	Angle

LIST OF ABBREVIATIONS

PCA	Principal Component Analysis

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter will discuss the background of the project, problem statement, objectives, scope of the project, and significance for this project.

1.2 Project Background

The agricultural sector is an important area for Malaysia's economic growth after the manufacturing and services sectors (Echoh *et al.*, 2017). The agricultural sector has played an important role since the 1960s in providing food supplies to satisfy the growing population, reducing unemployment as a source of export earnings, supplying agro-industrial production with raw materials, etching (Echoh *et al.*, 2017). Figure 1.1 below show the Pie chart of Plant Statistics (Sub-Sector of Food Plants) 2019.

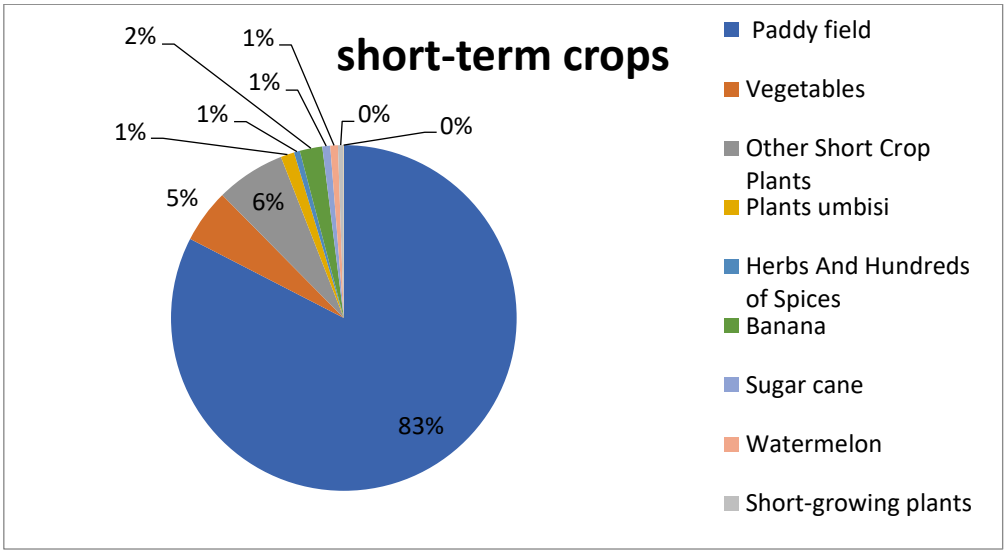

Figure 1.1 Pie chart of Plant Statistics (Sub-Sector of Food Plants) 2019.

Paddy rising has been a source of jobs for 150,000 people in Malaysia. Those involved depended solely on paddy growing for their source of income Paddy increasing has been a source of jobs for 150,000 people in Malaysia (Muazu *et al.*, 2014). Those involved depended solely on paddy growing for their income source (Muazu *et al.*, 2014). There are two kinds of paddy in our country: wetland paddy (paddy field) and dry land paddy (upland and lowland). Wetland Paddy refers to paddy planted on water-logged lands during its growing process, and Dry Land Paddy refers to paddy planted on dry areas, whether highland or lowland and relies solely on rainfall due to its water requirements. However, only wetland paddy is grown and is extremely desirable for cultivation and is ideally suited to cultivated plains and rich deltas. As we have discovered, there are many rice crops in Kedah, Kelantan, Perlis, Terengganu, and Perak. Therefore, the plateau of Kedah and the plateau of Kelantan are already known as rice paddy (Myagro, 2017). Figure 1.2 below shows the Wetland paddy and Figure 1.3 below show the Dryland paddy.

Figure 1.2 Wetland paddy

Figure 1.3 Dryland paddy

Paddy, after oil palm and rubber, is Malaysia's third most widely planted crop. In 2014, 679,239 hectares of paddy were cultivated, including those planted twice a year (Paddy Statistics of Malaysia, 2014). The rice crop has two main seasons and Unseasoned. The Main Season is the time to grow paddy without padding any irrigation system depending entirely on it. For administrative purposes, the main season is specified as the starting date for paddy planting, from 1 August to 28/29 February of the following year. The dry season is the off-season, and paddy planting is typically based on irrigation. Off-Season is identified as the starting date for paddy planting for administrative purposes between 1st Mac and 31st July of the year (Paddy Statistics of Malaysia, 2014). However, Malaysia has a large paddy field that cannot meet the population, so Malaysia needs to import rice from other countries to meet the rice needs in Malaysia. Figure 1.4 below show the Pie chart of import of rice by country(Paddy Statistics of Malaysia, 2014).

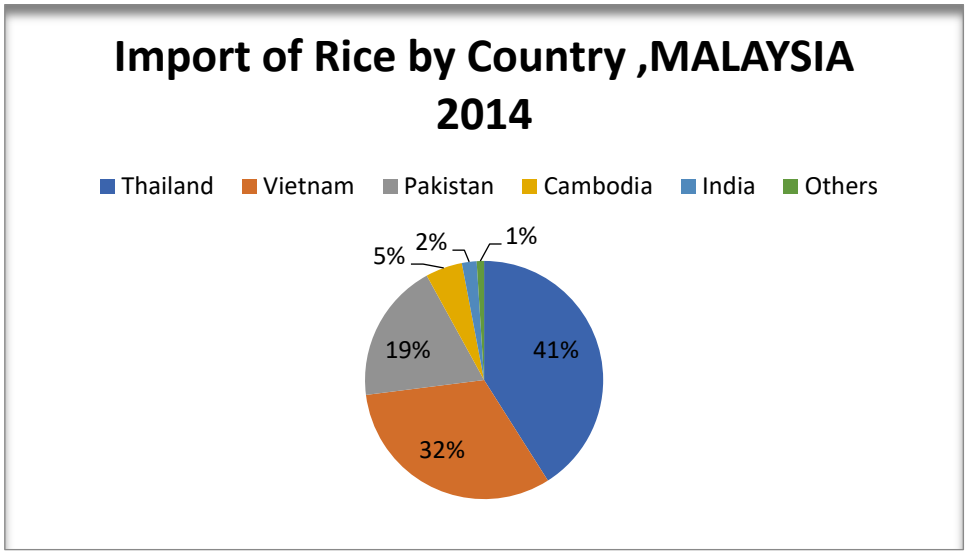

Figure 1.4 Pie chart of import of rice by country in Malaysia 2014.

1.3 Problem Statement

In traditional rice cultivation, there are various risks that rice cultivation itself can pose. This is because of the back pain this is due to the prolonged bending during the rice cultivation process. Besides that, the risk of being trampled on hazardous materials in the field, for example, stepping on rocks, glass or snakes and others can cause injury to farmers. Figure 1.5 shows the back pain.

Figure 1.5 Back Pain.

In addition, the high cost of renting an existing machine for rent is due to high maintenance costs. Therefore, when renting a high-yielding rice machine, the farmer's profitability will decrease due to the high rent of the rice cultivation machinery. Figure 1.6 shows the rice cultivation machine.

Figure 1.6 Rice Cultivation Machine.

The seedlings should be pruned first to the age of fewer than 15 days if over the ages the paddy tree will become a male and will not produce the paddy. If using seedlings, it will need a place to seedlings compared to seeds. Figure 1.7 shows the paddy nursery.

Figure 1.7 Paddy Nursery.