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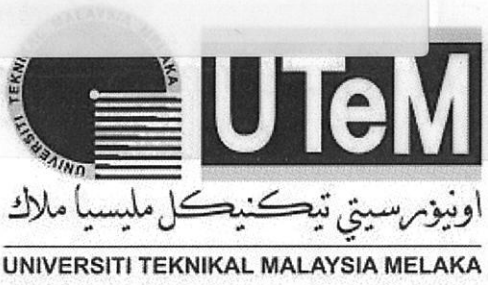

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

DESIGN AND DEVELOPMENT OF INGENIOUS DISHES VENDING MACHINE

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

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by

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FACULTY OF ELECTRICAL AND ELECTRONIC ENGINEERING TECHNOLOGY

2019

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BORANG PENGESAHAN STATUS LAPORAN PROJEK SARJANA MUDA

Tajuk: DESIGN AND DEVELOPMENT OF INGENIOUS DISHES VENDING MACHINE

Sesi Pengajian: 2019

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DECLARATION

I hereby, declared this report entitled DESIGN AND DEVELOPMENT OF INGENIOUS DISHES VENDING MACHINE is the results of my own research except as cited in references.

Signature: .....

Author : MUHAMMAD AIZUDDIN BIN RUFFEHE

Date: 8/1/2020

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APPROVAL

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

Signature: .....

Supervisor : Mr. Ahmad Idil Bin Abdul Rahman

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Co-supervisor: Mr. Johar Akbar Bin Mohamat Gani

ABSTRAK

Abstrak- Sistem pengumpulan pinggan mangkuk selepas makan di kafe adalah perkara yang sangat penting untuk terus menjaga kebersihan sesebuah kantin ataupun kafeteria. Ia disebabkan oleh sikap sebilangan pelanggan yang malas atau tidak bertanggungjawab yang hanya membiarkan pinggan mangkuk yang telah digunakan terbiar di atas meja. Selain itu, sistem yang sedia ada menyebabkan kekotoran di mana teknik secara manual meletakkan pinggan mangkuk yang tidak lagi degunakan di besen disediakan tidak releven, pada kebiasaanya, pelanggan malas untuk berjalan dan meletakkan pinggan mangkuk yang telah digunakan di dalam besen yang telah tersedia. Dalam projek ini, cadangan untuk menghasilkan satu sistem mesin pintar untuk pelanggan yang memulangkan pinggan mangkuk yang sudah digunakan dengan memasukkannya ke dalam mesin dan mendapat semula caj bayaran bagi penggunaan pinggan mangkuk yang digunakan sebanyak 50 sen untuk satu set pinggan mangkuk, sistem ini termasuk gelas, cawan, sudu dan garpu direka bentuk sebuah prototaip sistem mesin pintar bagi pengumpulan pinggan mangkuk. Sistem ini di mana jika ditambah baik dan diaplikasikan dalam persekitaran kantin dan kafeteria untuk projek ini berpotensi untuk dikormesilkan bagi memastikan persekitaran yang bersih, teratur dan sihat dapat dikekalkan seharian oleh pelanggan di sekitar kantin dan cafeteria, khususnya di bangunan-bangunan kerajaan, swasta dan universiti awam dan swasta di seluruh negara.

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ABSTRACT

Abstract- Establishing a smart system to collect used dishes plays a vital role in maintaining a clean and healthy environment at canteens and cafeteria. However, the informal attitude of customers nowadays who unwillingly to preserve the cafeteria cleanliness since they are irresponsibly failed to manage their used dinnerware themselves. Besides, the existing current system are not efficient enough where by the used dishes that are compiled in the provided basins can create a dirty and ill-fitting image to the café. Such system is not user friendly since most of the customers are demotivated to take the initiative to place their used dishes in the available basins provided. In this project, a proposed design of a smart and innovative system to collect used dished is introduced. The operation of the system is initiated by placing the used cutleries into the machine slot. The customer will pay their price meal inclusive with the charge of using the dishes. When they return the used dishes into the machine slot, the machine will return back the charged fee. The price for each plate is RM 0.50. Hence, the design and development of the Ingenious Dishes Vending Machine is introduced for this project. In addition, this project eventually helps to improve the cafeteria environment and potentially can be commercialized for daily usage at cafeteria. Furthermore, the effectiveness of the system on daily usage will be tested and evaluated according to its functionally and working performance.

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DEDICATION

To my beloved mother Muhairun Binti Zairan. I want to express my gratitude to them for all their love and sacrifice across my life and study. The sacrifice what they had done really make me inspired and the main reason for me to continue my study until now. Their support and faith for my ability to achieve my ambition is not something that can be contradicted.

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I also would like to expresses my big thank and deepest gratitude from the bottom of my heart to my mother Muhairun Binti Zairan for their unconditional support, encouragement, money and inspiration that I receive through of my final year project.

Last but not least, I would like to expresses my deepest and gratefulness to my classmate helping me during this project.

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LIST OF SYMBOLS

°C - Decibel

°F - Fahrenheit

Hz - Hertz

V - Voltage

ms - Millisecond

mm - Millimetre

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LIST OF ABBREVIATIONS

USB	Universal Serial Bus
UTeM	Universiti Teknikal Malaysia Melaka
IDE	Integrated Development Environment
GUI	Graphical User Interface
PCB	Printed Circuit Board
RGB	Red, Green, Blue
PWM	Pulse Width Modulation

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CHAPTER 1

INTRODUCTION

1.1 Introduction

This early chapter will explain about the project background, problem statement, objective, scope and expected results with regard to this project.

1.2 Project Background

Every hostel has their own food court such as the cafeteria and canteen which are the main source for students or colleagues to get their food. The cafeterias and canteens of dishes that come with the cutlery sets such as forks, plates, glasses and others. Providing these facilities in clean hygiene will give huge impact toward users, make them more comfortable and safer to eat when they enjoy their meals. This is dominant when providing these facilities since cleanliness and hygiene plays an important role when having meals.

One of the rules that need to preserve the cleanliness is that the cafeteria staff should cultivate a clean and comfortable area for the customers to have the meals. However, when the cafeterias do not implement this act, the authority facing a lot of cases such as social cases and health problem issues, such as food poisoning. Health issues from food contamination can cause serious illness to the customers. Food poisoning can even lead

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to serious death cases if the authorities and cafeterias do not take any action to avoid this problem.

The table cleaning approach that currently carried out manually by users such put their cutlery themselves when they put their used cutlery into the provided can cause an ill-fitting scenery and can attract flies, cockroaches, ants and even rats. It is due to irresponsible attitude of user not to clean up properly. Therefore, cafeteria will have problem to attract customers since the place dirty and unattractive. Such example of unpleasant scenery is users' cutlery tables with unfinished leftovers.

Hence, this project is developed on plate to encourage cafeteria and smart users displays to put their used cutlery after they finished their meal. This can help costumers encourage them in practicing good hygiene. Thus, it will provide a cleaner cafeteria environment and comfortable for next users to have their meals at the cafeteria it can avoid unpleasant smell in cafeteria. Additionally, this also can potentially avoid unpleasant smell and not attract flies or unwanted animals.

The project is designed in a way that is the system will return back the charge of using cutlery when they pay along with the meal. After they put the plate into machine slot, they will get their charge back.

Hence, by introducing the new practically cleaning table system it can help promote cafe to a comfortable scenery of cafeteria and can decrease the number of health issues regarding to food poisoning cases. However, authority need to check time by time to ensure the customers and cafeteria staff to follow the rules and always give the best contribution to preserve the cleanliness of the cafeteria.

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1.3 Problem Statement

Most of the cafeteria and canteens nowadays manual collecting the customer's used dishes by hiring the staff cafeteria or cleaners, where collected cutleries into the assigned basin. The basin is provided and placing the basin at the deepest corner that can possible unseen by customers of cafeteria. This is not a practical way since this can lead to food poisoning and creates used plates unpleasant smell occurrence at the corner of the cafeteria. Besides, not all customers will put their used plate after they finished their meal, since they expected the staff or cleaner will clean up for them.

Hence forth, adding the number of workers margin for the café revenue. Collect used cutleries is required as the number of customers to the cafeteria increases. Paying salary or labour cost to collect cutleries can lead to a decreasing profit. Besides, this process is not relevant, since the clean-up process will slow down peak hours such as breakfast and lunch time. During these hours, a lot of customers will have their breakfast and lunch hour at the cafeteria.

Furthermore, irresponsible attitude of the cafeteria's user cafeteria is another main problem that need to be over the importance to use the cafeteria for having meals. They are hard and lazy to clean up their leftovers after they ate. Some of them do not think for the next user. With the new introduction of system when they use the machine of collecting used dishes, students will encourage to put their cutlery and their money will return back.

In addition, the manual system can cause a terribly dirty and disgusting image to the cafeteria. This is obvious when some of the users do not follow the rules that are given by the authority. They sometimes throw their meals leftovers into the basin together with the plates. They eventually do not practice to initiatively separate apart between plate and

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the used dishes with food leftovers. This can lead to unpleasant smell and attracts unwanted creatives, such as flies' ants, mosquito and even rats. During peak hours, if there is only one staff available to collect the used cutleries, it can cause insufficient management and can depicts a terrible and dirty environment at the cafeteria.

Finally, the current traditional system is not user friendly since the costumers need to put the dishes by manual to the basin provided or wait for the cafeteria that staff to collect the dishes at table. The old-fashioned system will cause the customers more tend to left their dishes on the table instead sending them by self to the basin. Due to that reason, the cleanliness and hygienic of the cafeteria will often dirty and cannot be prevent. Finally, the leftover will attract the flies come then will cause the disease.

Hence, the developed system presented by this project are aimed to:

1. To eradicate the irresponsible attitude of customer's cafeterias.
2. Manually system can cause a terrible environment and for the for the place to stay dirty.
3. To eliminate the feature of not user friendly to be used collectively by family.

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1.4 Objectives

The objectives of this project consist of three main aims which are:

1. To design and develop a prototype of dishes collecting system.
2. To implement and apply the design system on daily basic usage at cafeteria UTeM.
3. To evaluate the effectiveness of the designers and performance system based daily usage on its functionality and accuracy to operate daily.

1.5 Scope

This project is restricted to the following scope:

1. Only applies for the cafeteria located in Technology Campus UTeM.
2. The program identification is using implemented the Arduino Uno.
3. To analyze the performance of the system, according to daily usage.
4. The Design and Development of Ingenious Dishes Vending Machine is only focused on collecting and clear the used for dishes in daily usage at cafeteria in Faculty of Technology UTeM. The designed or develop prototype of the dishes collecting system is depicted.

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