UNIVERSITI TEKNOLOGI MARA

DESIGN AND FABRICATION OF SMART CUP SORTING SYSTEM FOR A CAMPUS CAFETERIA

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ABSTRACT

Conveyor belt is a convenient system to transport loads along a certain distance, usually heavy loads through a long distance that would require huge human work and energy. By using the conveyor system, it can save a whole lot of amounts of time and energy. Evolution of technology has made the human life simpler, by making a machine that will help them through their daily lives. A simple example can be look through our daily routine such as at the cafeteria, where customers do not return their used dishes in the bin according to their colours. This is inconvenient for the staff since each stall usually has their own kitchen utensils. The customer mixing them up in the bin would be another work for the staff to sort and collect their plates and cups. The main goal of this project is to help ease the burden of the staff by creating a smart sorting system using Arduino that will detect the colour of the cups and sort them into their designated cabinets. One of the methodologies used is by observing different cafeterias from different universities and find out their dishes system. Theexpected result of this project is to help the customers and the staff to ease their burden by collecting neatly stacked cups in the cabinets. Other than that, it is also expected for the students to learn and find out more about Arduino system and coding.

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CHAPTER ONE
INTRODUCTION

1.1 Background of Study

A conveyor system is an efficient mechanical apparatus that is used mostly in industries to transport loads and materials automatically to a certain desired area. It is done by solely relying on power supply and machines and does not require manual labour. A sensor is a device that produces an output signal for detecting, measuring, or sensing a physical property and responds to it. By combining conveyor system with sensors, a sorting system can be created.

An issue commonly faced in a university cafeteria is to sort the food utensils to its rightful owner. This project's goal is to focus on the drink stalls. Generally, each stall would have different coloured cups to differentiate one cup from another. This helps both the workers and the customers to identify the correct beverage easily. However, by having different coloured cups can be quite challenging as the customers would have to manually sort them into different basin each time. The real problem comes when there are some customers who would just put the cup randomly without sorting them by colour, which will be troublesome for the owners to come and collect them by the end of the day.

The most efficient solution to this problem is to implement a conveyor system with colour-detecting sensors. This automated system will lessen the manual labour; sorting and collecting the cups by the staffs. The way the system work is the customers will return their dirty cups to a designated area, where they are placed on a conveyor belt. The cups will move along the conveyor and the colour of each cup will be identified by colour-detecting sensors that were positioned along the sides of the conveyor belt. Once a certain colour is detected, the cups are automatically directed to its designated route and cabinet. The staff will then collect their cups from their assigned cabinet.