AUTOMATIC RUBBISH COLLECTOR

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This report is submitted in partial fulfillment of the requirements for the award of Bachelor of Electronic Engineering (Industrial Electronics) With Honours.

Faculty of Electronic and Computer Engineering
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To my beloved family.

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APPRECIATION

I grateful to Allah, after 3 years at Universiti Teknikal Malaysia Melaka I ready to complete my study and also complete the Final Project. This here, I would like to appreciate to any person direct or indirect help me to complete my final project. Thanks full again to my family, my supervisor and also to all my friend.

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ABSTRACT

This project is to construct one automatic rubbish collector especially for river and drain and all of this process will be control by automatic system. This project will be install at a river, drain or water course. Automatic rubbish collector is not only to gather the rubbish but for the process to collect also will do by this system. If compare with the conventional system, process to collect the rubbish will do by human power and sometimes process to collect the rubbish cannot follow the schedule. This problem can give a many problem to environment. One of solution to solve this problem is design the new system where all process of this system will be control automatically. For this system, the main controller can be used is Programmable Logic Controller (PLC). Beside that, have a several additional part shall be install at this system like as Limit Switch, Power Window Motor, Push Button, Relay and Toggle Switch. Programmable Logic Controller (PLC) used as a main control because this equipment easy to reprogrammed if have a additional process or want to decrease the several process and also this equipment easy to wiring from hardware to main controller.

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ABSTRAK

Projek ini bertujuan untuk membina satu perangkap sampah yang dikawal sepenuhnya oleh sistem automatik. Perangkap sampah ini akan dipasang samaada di dalam sungai, longkang ataupun tali air. Perangkap sampah sedia ada hanya mampu untuk mengumpulkan sampah sahaja namun proses mengangkat sampah akan dilakukan oleh manusia. Proses ini kadangkala terganggu akibat daripada kelewatan pekerja mengangkat sampah dan situasi ini akan menimbulkan pelbagai masalah. Masalah inilah yang cuba di atasi di mana satu perangkap sampah automatik perlu di reka dan dibangunkan. Pengawal yang digunakan di dalam sistem ini adalah Pengawal Logik Boleh Aturcara (PLC). Disamping itu juga, terdapat peralatan tambahan yang digunakan seperti Suis Terhad, Motor Arus Terus, Suis Tekan, Geganti dan Suis. Pengawal Logik Boleh Aturcara digunakan sebagai pengawal kerana peralatan ini mudah dilakukan pengubahsuaian program sekiranya terdapat tambahan atau pengurangan kepada proses. Disamping itu juga, proses pendawaian juga amat mudah dilakukan.

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LIST OF ABRIDGEMENTS

PLC	-	Programmable Logic Controller
ARC	-	Automatic Rubbish Collector
DC	-	Direct Current
AC	-	Alternate Current
PSM	-	Projek Sarjana Muda

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CHAPTER 1

INTRODUCTION

1.1 PROJECT BACKGROUND

Malaysia is a one of country in the world have a beautiful river. But at this time the condition of river in Malaysia very bad with behavior of Malaysian people like to throw the domestic waste into the river. This action can make flood occurred and make many people nearest the river suffer.

Malaysia government invest every year to make sure the condition of the river at the good condition. Many program from Ministry of Agriculture did to launch to give more expose about deterioration of habit like to throw the domestic waste into the river. Beside that, government also invest many money to build the rubbish trap but this solution not give the big impact to make sure the river clean from the waste. The best solution is come from Malaysian people about importance to protect the river.

Another program from government to ensure the river environment clean from the waste is hire the contractor to collect the waste. But sometimes the contractor not follow the schedule to collect the rubbish. This problem make the waste increase everyday and certainly give the bad reputation to tourist when visit the Malaysia country. For example, we can take the Klang river where did the bad river on Malaysian. Like we know everyday we can hear about the waste problem

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occurred at Klang river and we are also hear about flood destroyed the residence and asset. This problem need the solution to ensure Klang river absolve from the waste problem.

One of the solution is design the waste trap to collect the rubbish to follow the schedule or time set. From this problem, Automatic Rubbish Collector will be design to solve this problem.

1.2 PROBLEM STATEMENT

Have a several problem identify before to create Automatic Rubbish Collector. The problem occur is like waste in the river and drain, river contamination, continuous process, conventional system and reduce human power.

1.2.1 Waste In The River And Drain

This problem can occurred when the people throw the rubbish into drain or river. This action can induce the flood and can create the smelly environment. Beside that, mosquito problem also can happen and this give the danger environment to people.

1.2.2 River Contamination

River contamination is a big problem today because many river at Malaysia expose to bad attitude of Malaysia citizen. For example, many river at big town have a bad scenery and give the bad reputation to the tourist especially Klang River. Klang River is a main river in Kuala Lumpur city. But failure from government to take any action to clean back Klang River give the negative assumption from people to municipality management.

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1.2.3 Continuous Process

Waste in the river need the continuous process to make sure the river free from contamination. This process can be continuous if all the system change to programming system. Either programming system can use to make the system control automatically is Programmable Logic Controller (PLC). All system will be control by a timer and all process can set follow by system requirement.

1.2.4 Conventional System

At Malaysia, the system to use to collect or manage the waste still use the conventional system. For example, at Klang River net will be use to block the domestic waste but at the same time process to collect the waste shall use manual system. Manual system mean is still use the worker from human to collect the rubbish or waste. Figure 1.1 is show how the conventional system operated used the net system. For figure 1.2 show one of rubbish collector machine used at handle by human to operate.

Figure 1.1 Conventional System. Use net to block rubbish

Figure 1.2 Rubbish Collector Machine use at Padang Jawa

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1.2.5 Reduce Human Source

Work with waste environment can expose the human to bad side effect. In the sophisticated area and to achieve advance country now time to make sure any work or job where can give the bad side effect to people will be complete by machine or robot.

1.3 OBJECTIVE PROJECT

The main project objective to build this system is :

i. To design and build one equipment to collect automatically rubbish in the river.
   - ✓ Ensure the rubbish collector system at Malaysia can use in automatically system without destroy the ecosystem.

ii. To design one systematic process in collecting rubbish field and to make sure process will be continuous without monitoring by supervisor.
   - ✓ Ensure the process system will do at everyday or follow the setting time without any monitoring from supervisor. This system can ensure the collecting process will follow the schedule.

iii. To learn about PLC program include Ladder Diagram of PLC.
   - ✓ Practice what which study in the class to real environment and to familiarize the student with work environment.

iv. To comprehend of PLC wiring diagram and real wiring of PLC between hardware.

v. To reduce the river contamination and to raise the quality water.

1.4 SCOPE PROJECT

For running this project, student should be have a scope of project to make sure the project achieve their objective. This project just a model of auto collector rubbish. The size of project is not follow the real size of river and the power of motor using also not proper to used for the real project. This model just give the figure for

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the auto collector rubbish and how this project function. Auto collector rubbish will used the PLC as a main brain to control all system.

1.4.1 Produce The Prototype

This project to build mini prototype of the Automatic Rubbish Collector Using PLC System. Size of project very minimized if compare with the real size. Size of real project also depend from size of river or drain to install. This project very flexible and can do the upgrade process to give high performance.
Installation The Programmable Logic Controller (PLC)

Programmable logic controller or PLC is a main controller for this project. All process will be control by PLC ladder diagram and any change of the process can repair at ladder diagram. Ladder diagram instruction will be install or kept in PLC memory to run the process. From ladder diagram also, any problem occurred can be detect and shall to repair.

1.4.2 Design Ladder Diagram

Design the ladder diagram follow from process type to ensure the system operate in every steps. If have mistake at ladder diagram will be stir up in mistake at operation of project.

1.5 PROJECT EXPLANATION

Automatic Rubbish Collector Using PLC Systems is a one system to collect the rubbish or waste in the river and drain automatically. Main objective to design this project is to ensure the collecting process operation in consecutive condition.

Automatic Rubbish Collector is control by Programmable Logic Controller (PLC) unit wherever this system will be install together the project. To operate this project, ladder diagram will be design to assemble the process step. From ladder

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diagram, all sequence of the project step will be show. That is make easier to troubleshooting the problem.

Another components used to build this system is power window motor. Power window motor is a DC motor and need the small supply to operate. Beside that, price of each power window motor very cheap make that motor is selected to use for this project. In this project, power window motor will move in two condition where for the first condition is at forward and at the second condition is at reverse condition. Polarity of supply to power window motor will be change for reverse condition.

In this project, timer also can be used to control every movement. Time for every process can be selected by supervisor in charge but in this project, time to control every operation not follow the real time.

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1.6 PLACE TO INSTALL

After make the research, have a several place suitable to install Automatic Rubbish Collector. Another top place can be install this system is drain, water course and river.

1.6.1 Drain

This project can be installed at the small or large drain. This concept for all of concept still be same. Figure 1.3 is shown the example of drain can be install this system. Time to collect the rubbish and waste can be set follow the supervisor.

Figure 1.3 Drain

Merely for design at drain, more safety needed to avoid the system and also to avoid the human from danger.

1.6.2 Water Course

Water course use to supply the water into the paddy field. Water want to supply must be don't have any rubbish or waste.

This waste sometime can give the bad effect to the growth of paddy. Figure 1.4 can shown the type of water course where the system can be install to trapped the rubbish.

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