

UNIVERSITI TEKNOLOGI MARA

**DESIGN, FABRICATE AND ARRANGE A BASE
STRUCTURE FOR A ROBOTIC ARM
CAR**

**HARRIS EIDMAN BIN MOHD
NIZAM**

DIPLOMA

Feb 2025

ABSTRACT

A robotic arm car is used to pick up objects on any terrains and placing it to its designated place. There are many robotic arms created as of nowadays yet it is commonly fixed on the place it is assembled. In order to improve the designs that has been made, the objective is to design a balance and stable base structure for a robotic arm car. This project shows the detail on the process to produce the machine, from its design to fabricating it and all the manufacturing process that it will undergo. This project aims for kindergarten uses as to help caretakers in doing chores while being more relaxed and aims for exposing kids and children of the robotic world thus making them interested and excited to know more and learn more about robotics.

ACKNOWLEDGEMENT

Firstly, I am thankful to Allah for providing me with the opportunity to further my study in Diploma in Mechanical Engineering. A very special thanks to my supervisor, Miss Liyana binti Roslan for fully guiding me and being a really understanding supervisor to complete this course. Also, thanks to my fellow friends and groupmates that assist me in completing this project. Finally, this dissertation is dedicated to my father and mother for the vision and determination to educate me. This piece of victory is dedicated to you both. Alhamdulillah.

TABLE OF CONTENT

CONFIRMATION BY SUPERVISOR	iii
AUTHOR'S DECLARATION	iv
ABSTRACT	v
KNOWLEDGEMENT	vi
TABLE OF CONTENTS	vii
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF ABBREVIATIONS	xii
CHAPTER ONE: INTRODUCTION	1
1.1 Background of Study	1
1.2 Problem Statement	2
1.3 Objectives	3
1.4 Scopes of Work	3
1.5 Significance of the Project	4
CHAPTER TWO: LITERATURE REVIEW	5
2.1 Benchmarking / Comparison with Available Products	5
2.2 Review of Related Manufacturing Process	8
2.3 Patent and Intellectual Properties	9
2.4 Summary of Literatures	12
CHAPTER THREE: METHODOLOGY	13
3.1 Overall Process Flow	13
3.2 Detail Drawing	14
3.3 Engineering Calculation and Analysis	27
3.4 Bill of Materials and Costing	32
3.5 Fabrication Process	33

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

A project that combines a robotic arm that can move around on wheels and can be controlled on any gadgets with ease. A robotic arm mainly used in factories to automate execution of repetitive tasks [1] whilst a car is usually a four-wheeled vehicle designed primarily for passenger transportation [2]. This machine's ability to move around on any terrains and grabs any items thus placing it back on its designated location are very suitable for most workspaces. It may help many in moving objects while relaxing and decreases the labour work for man. A strong base structure is required as to uphold the weight of the Robotic Arm Car and provide it with great support and balance. For every object, a true balance measures mass directly by comparing the unknown mass to a known mass [3] thus why the base acts as its centre and upholds the robotic arm car balances.

Any machines and structure all requires a strong and solid base as it is the main part in any design. Imagining a human body without a body may seems odd and incomplete thus the reason any items and machines to have its body that is strong and provides strong support and magnificent balance. With usage of affordable that not only is strong and sturdy but also does not require any welding process makes the item light-weight and can be assembled parts by parts with ease. With proper airflow that helps in cooling down the engines and other parts that is placed and stored in the base can help make the project looks more friendly and not too messy.

This project targets the nursery industry as to help the caretaker in taking care of the children and also doing the chores. Caretakers are able to sit back and relax whilst doing the cleaning and picking up toys that are played by the children there. A simple controlling system that even some kids are able to manoeuvre and use it will also help the caretaker in keeping the place tidy and clean.