

UNIVERSITI TEKNOLOGI MARA

**DESIGN, ANALYSIS AND
FABRICATION OF MOTORIZED
ADJUSTABLE TELEVISION WALL
MOUNT**

AIMAN HAKIM BIN AMIR JAMES

Dissertation submitted in partial fulfillment
of the requirements for the degree of
Diploma
(Mechanical Engineering)

College of Engineering

March 2022

ABSTRACT

An automated television wall mount was designed, and a prototype built to provide remote control adjusting of the physical orientation of a flat screen television. Watching a television with full focus needs a head on perpendicular to screen. There are also some users place their television in a higher place on a wall and once they must change the angle of the screen will tire them. The objective of this project is to create and develop an adjustable television wall mount with motorized control design effortless adjustment and full motion flexibility with maximum available viewing angles. Another objective is to analyse the product to make sure it will work very well as expected. There are some methodology solutions are used in this project. The first one should be creating a morphological chart with listing a lot of possible solutions to create and sketch designs as much as possible. Then, all of the sketch designs will be evaluated through Pugh chart to see which one of all the designs score the highest point of criteria requirement compared to the existing product today. The one that chosen design from Pugh chart then will be redesigned with detail measurement using CAD software. The CAD software that will be used is SolidWorks 2021 by Dassault Systèmes SE. The analysis and simulation will also be done in the software. Once the design and analysis are done with good result, then the product need to be fabricated into a real prototype. As an expected result, the motorized wall mount should be able to handle a television with 25 kg maximum weight, up to 50-inches size and can rotate the viewing angle up to 45 degree to right, left, up and even down without any issue. The significance of this project is to ease the users with motorized control design effortless adjustment.

ACKNOWLEDGEMENT

Firstly, I wish to thank God for giving me the opportunity to embark on my diploma and for completing this long and challenging journey successfully. My gratitude and thanks go to my supervisor, Mr. Noor Hafiz bin Noordin.

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 both of you. Alhamdulillah.

TABLE OF CONTENTS

	Page
CONFIRMATION BY SUPERVISOR	ii
AUTHOR'S DECLARATION	iii
ABSTRACT	iv
ACKNOWLEDGEMENT	v
TABLE OF CONTENTS	vi
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	1
1.3 Objectives	2
1.4 Scope of Work	2
1.5 Significance of Study	3
CHAPTER TWO : LITERATURE REVIEW	4
2.1 Television Wall Mount	4
2.1.1 Advantages of Wall Mount Television	4
2.1.2 Disadvantages of Wall Mount Television	4
2.2 Television Stand Mount	5
2.2.1 Advantages of Stand Mount Television	5
2.2.2 Disadvantages of Stand Mount Television	5
2.3 Types of Wall Mount	6
2.3.1 Fix Television Wall Mount	6
2.3.2 Tilted Television Wall Mount	6
2.3.3 Full Motion Television Wall Mount	6
2.4 Information on existing products, patents, standards	6
2.5 Product design specification based on literature review	8

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

The project involves designing, analysing, and fabricating of motorized adjustable television wall stand. This project is about the television wall stand where user can adjust horizontal angle of view and vertical angle of view using motors' powers through the remote. The user can control the horizontal dan vertical view angle of television by using the remote provided. However, the remote is not wireless in connection but it is wired. The remote is designed to be hung on the wall. The user must connect the socket to the AC source with AC to DC adapter provided in case to get the power for the wall stand motor. That is the simple explanation of how the prototype should work. This television wall stand will have more advantages than the normal wall stands in the market today.

1.2 Problem Statement

When talking about increasingly technologically advanced devices today, there are so many advanced televisions today such as light-emitting diodes (LED) system and Organic Light-Emitting Diode (OLED) system where it is created with slimmer and high technologies design.

Watching television with the head vertically straight perfectly towards the television is highly desired by television viewers [1]. By placing the television screen completely perpendicular to the view of the viewer can maximize the visible vision and optimize the effect of the 3D system found in the television as well as provide satisfaction to the viewer while watching television [2]. Most people today hang their televisions on the wall using fixed wall mount but only some of them are using the wall mount television that provides full angle adjustment. However, based on the survey provided, majority people really like the existence of adjustable angle wall mount for television because it provides ease of living with an adjustable angle. Some people have a rather large television that hangs on a high wall in a rather large living room. This is