UNIVERSITI TEKNOLOGI MARA

DESIGN AND DEVELOPMENT OF A SHUTTLECOCK LAUNCHER MACHINE

AHMAD AMSYAR ZUHDI BIN AHMAD RIZAL

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

College of Engineering

Feb 2025

ABSTRACT

This project aimed at designing and fabricate a device for badminton players, which when used independently, helps polish the skills of players. Current training methods mostly depend on the partner's skill and technique who keeps the shuttlecock flying that reduces the opportunities and the convenience of practice. This project deals with this problem by design and develop a shuttlecock launcher machine driven by DC motor technology. It combines a motor, a shuttlecock hopper, with a built-in mechanism for pitching them at various speeds, trajectories and directions. These features are being installed not only for safe operations but also for the prevention of accidents. The value of this endeavor lies in its aim to furnish these people with an instrument that is easy to use as well as practical, which can be used to develop skills, support autonomy, and boost performance while playing badminton. Moreover, the project is part of the advancement of sports technology and engineering, displaying its evolvement and challenging passion towards badminton. The sustainability factors such as energy efficiency, material selection and environmental impact assessment considered by the project will help in minimizing its environmental footprint and urge towards sustainable manufacturing and usage practices.

ACKNOWLEDGEMENT

First of all, I extend my humble appreciation to the Almighty God, for showering on me His gracious blessings and give me the opportunity to embark on my diploma and for completing this long and challenging journey successfully.

The completion of this project was a collective effort, and I am deeply thankful to all the individuals who played a role in making it possible. I would like to express my sincere appreciation to my supervisor, Sir Muhamad Faris Syafiq bin Khalid for his participation and assistance. He not only provided guidance and encouragement but also helped me choose the title for my Final Year Project.

I would also like to extend my thanks to my friends, housemates, and anyone who provided guidance and support throughout the project, sometimes until late at night. Their collaborative efforts, helpful ideas, and troubleshooting assistance were critical in achieving the outcome.

Furthermore, I acknowledge the contribution of the Assistant Engineer for providing the necessary resources and infrastructure to complete this project. Without their support, this project would not have been possible.

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

CHAPTER ONE
INTRODUCTION

1.1 Background of Study

Badminton is one of the most popular sports in the world. It is estimated that there are more than a billion admirers of badminton, particularly in world-class competitions. As a result, the number of new players in badminton has increased significantly. Badminton is a very popular sport in Malaysia and the players want to be the best in the world. Badminton is sport which is accordingly is played by everyone no matter of his level of skills. On the other hand, like any other sport which is pretty much resource-efficient, it makes equipping oneself accessible by anyone regardless whether they live in the area which is not easy to access any other sporting activity.

In badminton, player use a different ball named shuttlecock and not the ball which everybody uses in all other games. The shuttlecocks have a different dynamic from the other sports balls, so therefore players should be fast and nimble to hit them. This renders the game more exciting and thrilling. They are not about blindly copying our lives. The shuttlecock was fed by one of them, while the serve was returned by the other. Furthermore, mastering fundamental shots and knowing how to hit back the shuttle in the proper manner are the most vital qualities. Even though badminton is exciting, players often have difficulties with their training.

Therefore, it is imperative for every person to be continuously trained in order to polish their badminton skills. The main goal of the project is to provide players of all age group the ability to practice their badminton skills despite of their location, which no doubt, is particularly helpful when training on their own is essential. The idea of personal training is adopted by this initiative in order to give the individuals the opportunity to actively pursue the badminton objectives they desire and to upgrade their skills even if they do not have a training partner or convenient professional facilities.