



اوتونو سي تي مارا
UNIVERSITI
TEKNOLOGI
MARA

FACULTY OF MECHANICAL ENGINEERING

DIPLOMA IN MECHANICAL ENGINEERING (EM110)

J4EM1106F

MEC 332

DESIGN GROUP PROJECT

TITLE OF PROJECT: MULTIPURPOSE STATIONARY SET

CLASS GROUP: J4EM1106F1/F2

GROUP NO:

NAME OF MEMBERS:

MUHAMMAD ZULKHAIREE BIN MD ZABANI	2013840226
NORSHAFIQ RIZAL BIN NORAZMAN	2013655462
WAJIHUDDIN BIN HISYAM	2013644724
MUHAMMAD REDZUAN MOHD HAMZAH	2013679268

NAME OF LECTURER CLASS: Sir Mat Zaini Bin Katon

NAME OF SUPERVISOR : Ahmad Naufal Bin Adnan

REFERENCES: Sir Naufal Bin Adnan

CHAPTER 1: INTRODUCTION

1.1 BACKGROUND OF THE PROJECT

Basically we have three main ideas for our proposal to be chosen in our subject MEC332 as our Final Year Project. Those 3 ideas are: Mul purpose portable culinary set, multipurpose portable stationary set, and the multipurpose portable hygiene set. Our final idea proposal that we have chosen for the Final Year Project is the multipurpose portable stationary set through the Pugh method of selection. Our group has discussed about the practicality, fabrication, costing, saleable, and also feasibility of the idea concept with our supervisor and found out that the 2nd idea which is the multipurpose stationary set is the best among the other two ideas. The idea of this multipurpose stationary set is that it compromises of functions such as a pen, highlighter, liquid paper and also a laser pointer which makes it an ideal item for the educational members such as students, teachers, lecturers and mostly the public. Further details and novelty of the project will be explained more in the project objective below which can be found in (1.2 Project Objec ves)

1.2 PROJECT OBJECTIVES

The most common problem student's face in this fast pace technological world is that they always seem to forget to bring a complete set of stationaries. Not only that, they also tend to misplace their pens or any other stationaries or even loose them. By generating our idea of combining all of the essential stationary items into one pen hence, the multipurpose stationary set, not only it could save space because it is compact in size, have many functions in just one single pen. Not only it is light- weight but it is also easy to use or operate plus it is highly portable although it has many items in it. Furthermore the pen is user friendly and efficient. This project of us can help users in so many ways such as time, weight, space, easy to use, and highly portable. If this project of us functions well then we believe it has potential market value for investors.

CHAPTER 2: DESIGN PROBLEM DEFINITION

2.1 Market Analysis

2.1.1 General Need for Product

This product is made to help the public from bringing many types of accessories to class, office and everywhere. Besides that, it will also help us to overcome the misplaced or lost things problems because all basic stationary items are brought in one item only. Not only it saves space and is portable, it saves time for students, lecturers, professors or any other type of people in the education category because of the combined items all in one pen hence, the multipurpose stationary set. Plus you don't have to bring a pencil box to class or any other places (saves a lot of space). Furthermore it is as light as an ordinary individual pen because of its lightweight materials. The price of the product is also quite reasonable depending on the amount of functions it has in the pen. So we can conclude that the price of our product is very affordable with good reasons.

2.1.2 Description and Estimation of Market Size

We are focusing of selling this product to publics especially to students and lecturers and also teachers. Next for our estimation of market size we are targeting more to the educational members for our potential buyers. Meaning that our buyers will be in the range of students to lecturers/teachers/professors.

Type of Pen	Percentage of Human Usage (Students, Lecturers ,others , etc)
Mul color Pen (4 in 1)	35%
Normal Individual Pen	Almost 100%
Multifunction Pencil Box	30%

2.1.3 Competitive Product and Benchmarking

We have a lot of competitive products that could compete with our multipurpose stationary set. Our main competitor is any type of pen but specially the one with the 4 in 1 colors pen. Furthermore, our other competitor that could compete with our product is the multifunction pencil box, although it is not in the pen category but it still has the multipurpose ability. Then for our benchmarking we select the medium level type of company such as Stabilo and Faber-Castell.

Features : - Multipurpose ability (pen, highlighter, liquid paper, laser pointer)

- Portable
- Light weight
- Compact size

2.1.4 Opportunity for Competitive Advantage

For our product we have more advantages than limitations that other products lack. For an example we have a pen, liquid paper, highlighter, and laser pointer all together combined in one item. Unlike the typical 4 in 1 pen, they only have 4 different type of color. Plus it is highly portable and prevents users from misplacing their pens in this case you need to bring one pen for all. As we all know, the multifunction pencil box is just a place where we put our stationaries all together. But it does not provide the function like our "Flash Pen" which is fulfilled with other functions such as highlighter, liquid paper and laser. Also it is called the "Flash Pen" because of the fast functions and laser pointer.

2.2 Physics of the Artifacts

For our product we use the knowledge of the amount of force used in (statics), the stiffness of spring constant in (dynamics), the suitable raw material (material science), to design the basic prototype of the product (Design Process 1 & 2) , to fabricate the prototype after designing (Manufacturing Process)

2.3 Criteria for Selecting the Product Design Concept

Design Parameter:

The basic components for the product is the spring, click button, frame for the pen, ink tube of the pen.

Design Variable:

For our upgrade in the product we have added a laser pointer, liquid paper and highlighter, thumb drive, and retractable calendar.

Constraints:

Limitations of our product is that the size of the pen is slightly bigger than other typical pens. Also it is quite difficult to fabricate the product but it can be done.

2.4 Preliminary Design Specification

The preliminary design phase may also be known as conceptual design or architectural design. During this phase, the level design concept is created, which will implement the complex electronic and mechanism requirements. This concept may be expressed as functional block diagrams, architecture description, design spec and sketch.

Product Identification

4 in 1. multipurpose stationary set, portable, lightweight, reasonable and affordable price.

Special features

- We added laser pointer, liquid and highlighter into the pen.
- Also with the features that we already have we combined them into one type of pen.

Social, Political and Legal Requirement

- The product following the ISO International Standards to ensure that product and services are reliable and good quality.
- The product following the MS Malaysia Standard to get buy in from relevant stakeholders in ensuring successful incorporated elements of standards and conformance in national education system.