



# DESIGN AND FABRICATION OF AIR CONDITIONING SYSTEM

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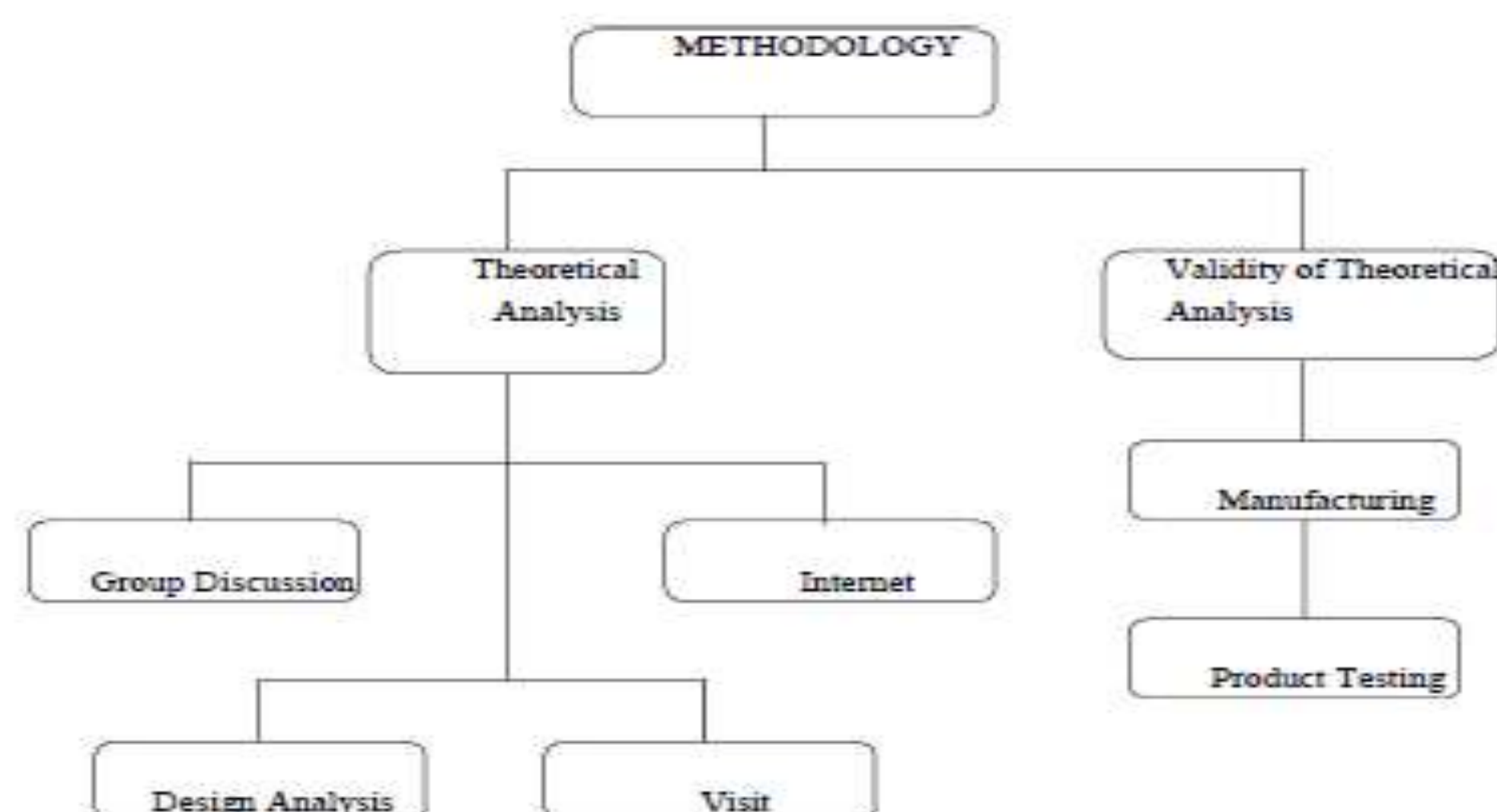
## Introduction

Optimised and Portable air conditioner is an innovation product originally from standard air conditioner that is limited to be used in room or inside building. Then, it is design to make it easier to move from one place to another. This portable air conditioner is equipped with ultrasonic sensor that can sense the existence of people in front of it and it will automatically switch off if there is no people and it will turn on back if it detect people crossing or standing in front of it. This will make people easier rather than switching on or off manually especially in the busy event. It is also economize the electricity when the usage is continuously without people using it which lead to waste the energy.

## Project Objectives

- I. Design and manufacturing of an air conditioner with high efficiency and low power input.
- II. Low cost air conditioning system.
- III. Portable and easily installable.

## Methodology



## Results and Discussion

$$R. E = \{4.5 \times (\text{enthalpy of } WBT \text{ at suction} - \text{enthalpy of } WBT \text{ at discharge}) \times CFM\} / 12000 \text{ ton}$$

$$R.E = 4.5 \times (51.5 - 47.5) \times 368.93 / 12000 \text{ ton}$$

$$\text{Refrigeration effect} = 0.55 \text{ ton} = 1.9329 \text{ kW}$$

Power consumption by air conditioner

$$\text{Power} = \text{voltage} \times \text{current}$$

$$= 220 \times 2.136 = 470 \text{ W} = 0.47 \text{ kW}$$

Coefficient of performance (COP)

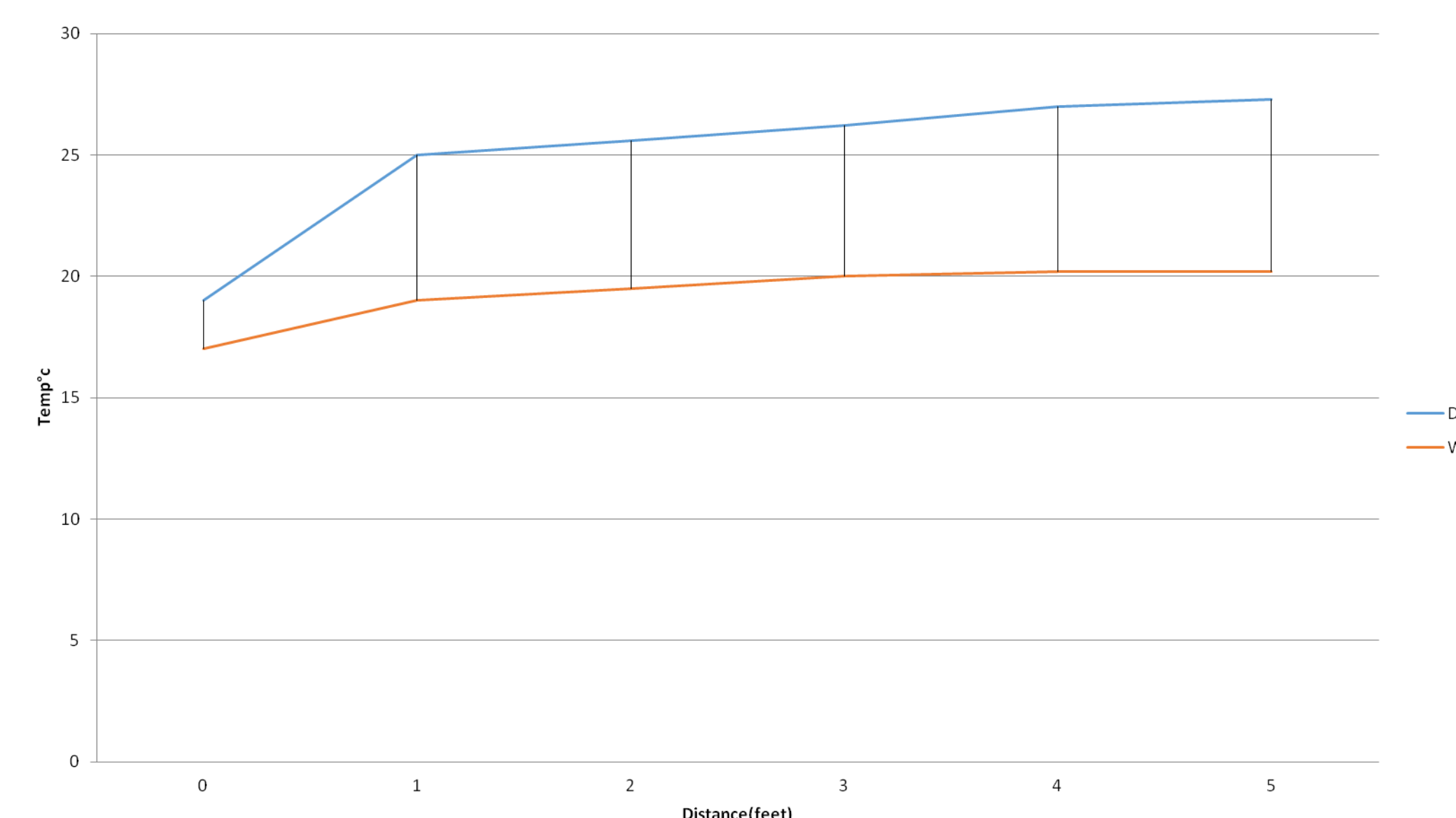
$$COP = \text{refrigeration effect} / \text{power input}$$

$$COP = 1.9329 / 0.47 = 4.1125$$

Theoretical COP ,

$$COP_{\text{carnot}} = Q_l / (Q_h - Q_l) = T_l / (T_h - T_l) = 289.5 / (318 - 289.5) = 10.15789$$

## Graph no. 1 Temperature v/s Distance



## Image

### Overview of Air-Conditioner



Figure 1: 0.5 ton AC

## Conclusions

we can conclude that a cheap portable air conditioner is achievable and can be marketable in reality. The portable air conditioner made satisfies the basic air conditioner functions for cooling purpose.

## Reference

1. J. Paul Guyer, 2009, Introduction to Air Conditioning Systems.
2. Air Conditioning and Refrigeration by P L baloney.
3. Thermodynamics by A.Boles.
4. Refrigeration and air-conditioning by R.K Rajput.

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