A Dissertation Report on

THE PORTABLE LIQUID HEATER

Submitted in partial fulfillment of the requirements for the course DTW-1

(20ME1103)

BACHELOR OF TECHNOLOGY

in

CSE

by

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DEPARTMENT OF MECHANICAL ENGINEERING

DECLARATION

The project report entitled "**THE PORTABLE LIQUID HEATER**" is a record of Bonafide work of **Mr. P.GOUTHAM ,SK.ABDUL ROHAN , R.VENKATA SAI RAM ,K.SHIVA REDDY , G.V.NIKHIL SAI** submitted in partial fulfillment for the award of B.Tech. in Computer Science Engineering to the **K L University**.

We also declare that this report is of our own effort and it has not been submitted to any other university for the award of any degree

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CERTIFICATE

This is to certify that the Minor Project Report entitled "**The Portable Water Heater**" is being submitted by of **Mr. P.Goutham ,Sk.Abdul Rohan , R.Venkata Sai Ram ,K.Shiva Reddy , G.V.Nikhil Sai** in partial fulfillment for the award of Bachelor of technology in Computer Science Engineering during the academic year 2021-22.

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ACKNOWLEDEMENT

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Abstract

The project title is "THE PORTABLE LIQUID HEATER", The project is about a water bottle which works as a portable liquid heater and, It contains two chambers in the bottle to store two different liquids at a time, it works like a tea kettle so that we heat any liquid we want to. And, the bottle's inner layer is insulated from the outer surface with a vacuum to stop the change of temperature of liquid inside of the bottle. and, we installed a small compartment in the bottle cap to store some things like medicines, tea sachets,coffee sachets

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Chapter 1

INTRODUCTION

In this semester I learned different concepts and how to use different apps and how are they useful. In CO1 I learned about Engineering Design Process and 3D modeling. By using Engineering Design In the process, I can get the best possible solution for the problem and by using 3D modeling I can get a virtual model of my solution, by using this we can save time, human effort, money. In CO2 I learned about the creation of a webpage using HTML. It is useful in many other ways. In CO3 I learned the usage of latex with which we can prepare a report, document, article, etc. In CO4 I learned about data visualization using Microsoft excel and power bi. by using this we can get our content more clear. This project report includes all the four CO's contents in it.

1.1 Engineering Design process

The engineering design process is a series of steps that engineers follow to find a solution to a problem. The steps include problem solving processes such as, for example, determining your objectives and constraints, prototyping, testing and evaluation.

While the design process is iterative it follows a predetermined set of steps, some of these may need to be repeated before moving to the next one. This will vary depending on the project itself, but allows lessons to be learnt from failures and improvements to be made.

The process allows for applied science, mathematics and engineering sciences to be used to achieve a high level of optimisation to meet the requirements of an objective. The steps include problem solving processes such as, for example, determining your objectives and constraints, prototyping, testing and evaluation.

The steps of the engineering process are not always followed in sequence, but it is common for engineers to define the problem and brainstorm ideas before creating a prototype test that is then modified and improved until the solution meets the needs of the engineers project. This is called iteration and is a common method of working.

Figure 1.1: Engineering Design Process

1.2 The step to be followed In Engineering Design Process

1. Identify the need or problem.
2. Research the need or problem.
3. Develop the possible solution.
4. Select the possible solution.
5. Construct a prototype.
6. Test and evaluate the solutions.
7. Communicate the solutions.
8. Redesign.

Chapter 2

EXPLAINATION

It is a team based project.

2.1 The brief explanation on the steps in Engineering process

2.1.1 Identify the need or problem.

What is the problem that needs to be solved? Who is the design product for, and why is it important to find a solution? What are the limitations and requirements? Engineers need to ask these types of critical questions regardless of what is being created.

2.1.2 Research the need or problem.

Use the experience of others to explore possibilities. By researching past projects you can avoid the problems faced by others. You should speak to people from various backgrounds, including users or customers. You may find some solutions that you had not considered.

2.1.3 Select the possible solution.

Brainstorming
Brainstorm Possible Solutions Good designers brainstorm possible solutions before opting to start a design, building a list of as many solutions as possible. It is best to avoid judging the designs and instead just let the ideas flow.

Consider Alternative Solutions
You may wish to consider further solutions to compare the potential outcomes and find the best approach. This will involve repeating some of the earlier steps for each viable idea.

2.1.4 Select the possible solution.

Once you have assessed your various options you can determine which approach best meets your requirements. Reject those that don't meet your requirements.

2.1.5 Construct a prototype.

Use your design proposal to make a prototype that will allow you to test how the final product will perform. Prototypes are often made from different materials than the final version and are generally finished to a lesser standard.

2.1.6 Test and evaluate the solutions.

Each prototype will need testing, re-evaluation and improvement. Testing and evaluation allows you to see where any improvements are needed.

2.1.7 Communicate the solutions.

The final stage is to communicate your results. This can be in the form of a report, presentation, display board, or a combination of methods. Thorough documentation allows your finished product to be manufactured to the required quality standards.

2.1.8 Redesign

Once testing has been completed, the design can be revised and improved. This step can be repeated several times as more prototypes are created and evaluated.

After your refinements have been completed and fully tested, you can decide upon and create your finished solution. This may take the form of a polished prototype to demonstrate to customers.

2.2 The step we followed in making our project

2.2.1 Identify the need or problem.

Nowadays it is common to use portable devices in our daily life. We decided that why can't we create a portable liquid heater. we know that everybody loves traveling in those times it is mandatory to carry a water bottle to store water and kettle to heat water it is because we drink is different in different places to not to fall ill in our traveling we need to maintain our health by drinking hot water for that we need have a portable liquid heater for us because as traveling means a lot to us it can be a hill station or anything else as the kettle is big to carry everywhere we go.

2.2.2 Research the need or problem.

Water pollution
widespread problem of water pollution is jeopardizing our health. Unsafe water kills more people each year than war and all other forms of violence combined. Meanwhile, our drinkable water sources are finite: Less than 1 percent of the earth's freshwater is actually accessible to us. Without action, the challenges will only increase by 2050, when global demand for freshwater is expected to be one-third greater than it is now.

Water pollution occurs when harmful substances—often chemicals or microorganisms—contaminate a stream, river, lake, ocean, aquifer, or other body of water, degrading

water quality and rendering it toxic to humans or the environment.

Nowadays in India we can see water is polluted everwhere we only have little amount of pure water. eventhough it is named pure water it contains parasites and bacteria in it we know that indian goverment treating the water and suppling to the all cities and villages but in rural areas it is little bit hard to get pure water free from bacteria so one of the remedies is to heat the water to kill the bacteria. so we wanted created the protable liquid heater.

We use the experience of others to explore possibilities. By researching past projects you can avoid the problems faced by others. We speak to people from various backgrounds, including users or customers. We found some solutions that we had not considered.Portability of liquid heater is necessary.

2.2.3 Select the possible solution.

we selected the below solution to proceed to next step. We decide to make portable liquid heater which works on battery power.And which is embeded in the water bottle. and it holds the water in a copper in bottle inorder to eliminate certain bacteria in the water.

2.2.4 Construct a prototype.

We also create a prototype of our idea in order to have basic idea of our project
If you want to see the 3D view here are the links

- The link for the cap
  https://a360.co/2Z9xKTG
- The link for bottle outer case
  https://a360.co/3aSJ0Xd
- the link for bottle inner case
  https://a360.co/3s6necq
- the link for bottle inner caps
  https://a360.co/3dRt60Y
- the link for bottle holder
  https://a360.co/3ymPclo

2.2.5 Test and evaluate the solutions.

We tested and evaluate the solution with our teacher Nitin sir.

2.2.6 Communicate the solutions.

We performed a review programme and we collect reviews and suggestions from the people about our project based on those sugesstion we redesigning our project.

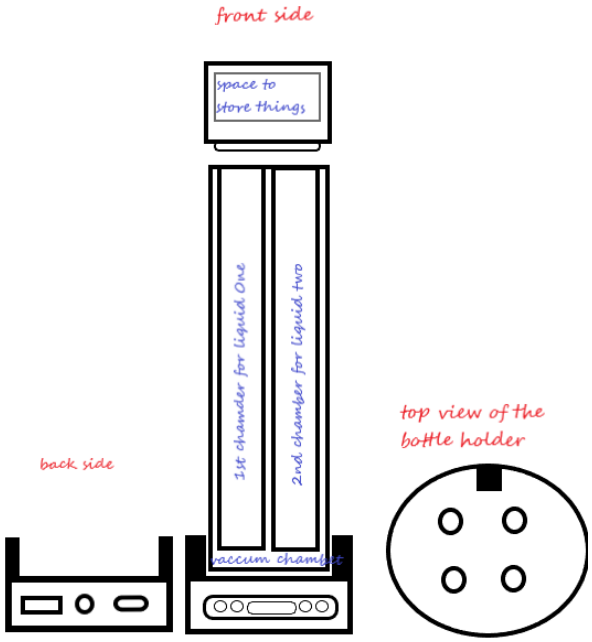

Figure 2.1: Rough sketch

2.2.7 Redesign

We redesigned the project based on the reviews and suggestions.

2.2.8 3d-Model

Figure 2.2: Outer Design of Bottle

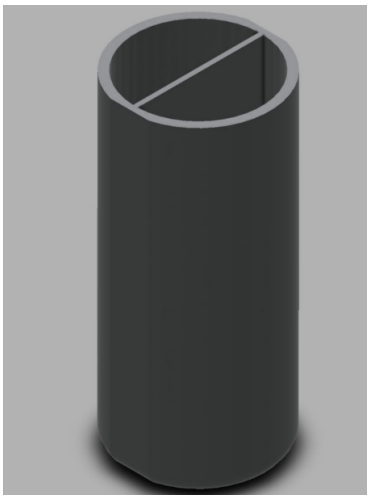

Figure 2.3: Inner Design of Bottle

Figure 2.4: Bottle Cap Design

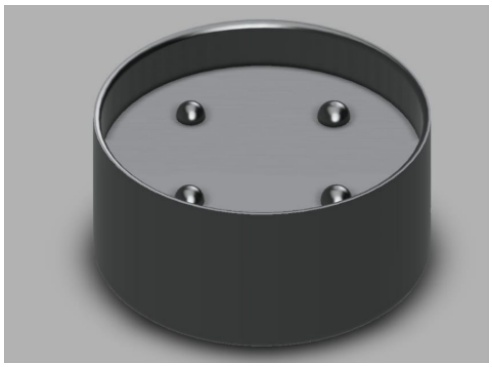

Figure 2.5: Bottle Holder Design

Chapter 3

Working

This bottle works on the principle of a basic water heater it is the modified version of the water boiler. we can boil water with the help of electricity anywhere using the plug or with batteries. the in-built water heater heats the water concerning time. it can hold up to 1 liter of water and can boil the water up to 100 degrees Celcius. the inner surface of the water bottle helps us to heat two different liquids at the same time.it is less power consuming and portable we can carry it anywhere easily without any trouble.it contains an empty chamber in the cap which is useful to keep medicines.

3.1 Advantages

- It can be carried easily.
- Liquids can be heated up to the required temperature.
- It works on battery power.
- it is made it environment friendly plastic and copper metal which increase the life span of the product and copper is used eliminate impurities.
- Drinking water in a copper bottle increase the person's life span.
- It is budget-friendly.
- Reuseable

3.2 Disadvantages

- It cannot store a huge amount of liquid.
- It won't work if there is no battery in it.
- It takes time to heat the liquid in the bottle.

3.3 Future enchantments

We can implement solar panels on the outer cover of the bottle but it takes more money it makes the cost of the product very high

3.4 Uses

It is a little bit hard to get pure water free from bacteria so one of the remedies is to heat the water to kill the bacteria. so we created the portable liquid heater. which can be carried anywhere.

Chapter 4

Conclusion

4.1 Things we learned in this project

- How to identify the problems in the things.
- How to find solutions to the problem.
- How to create a prototype using *fusion 360*.

4.2 Raw materials

The below values approximations cost may vary.

Serial.no	Items	Cost
1	Inner copper bottle	250RS/-
2	Copper wire	50Rs/-
4	Batteries	50Rs/-
5	Nichorme wire	50Rs/-
6	Electrical components	100Rs/-

4.3 Importance of drinking hot water

Drinking water, hot or cold, keeps your body healthy and hydrated.Some people claim that hot water specifically can help improve digestion, relieve congestion, and even promote relaxation, compared with drinking cold water. Most health benefits of hot water are based on anecdotal reports, as there's little scientific research in this area. That said, many people feel benefits from this remedy, especially first thing in the morning or right before bed.When drinking hot beverages, researchTrusted Source recommends an optimal temperature of between 130 and 160°F (54and71°C).Temperatures above this can cause burns or scalds.

Chapter 5

TEAM

5.1 Team Members of Batch 10

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THANK YOU