



Innovator Project

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General information

We live in an era where global warming is an imminent threat, especially in the decades to come. In Singapore, where temperatures have reached up to 36 degrees celsius, for some of us, entering a hot car after parking it in the blazing sun for over an hour feels horrible.



Problem Statement

How can we keep cars cool in hot weather?



Existing Solutions



Solution 1: Solar-Powered ventilation fan

The solar-powered ventilation fan attaches to the outside top of one of the car's rolled-up window, it has a outward facing solar panel that powers it. The fan blows out hot air from inside the car and pulls in the cooler air outside the car.



Solution 1-Pros and cons

Pros-

- Energy efficient as it is solar- powered and will work well in a country like Singapore, where the weather is always hot and sunny.

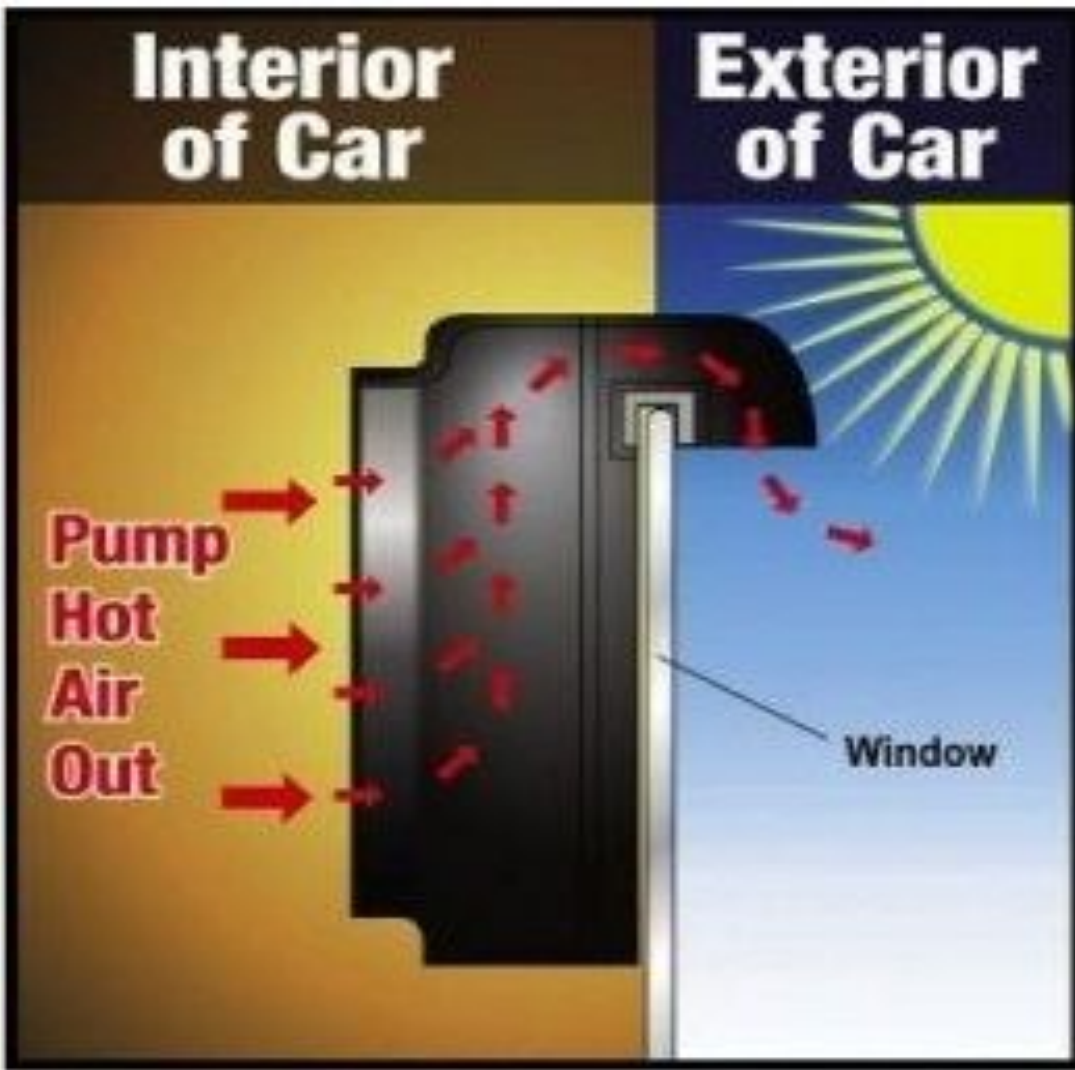
- Easy to install




Solution 1-Pros and cons

Cons-

- Product's function depends on its exposure to direct sunlight
- Can be costly to produce a high quality working one





Solution 2: Windshield Sunshade.

These are protective shields attached to a car's windshield and side windows to prevent the sun from reaching the interior of the car and keep the temperature of the interior of the car cool when parked under the hot sun.



Solution 2-Pros and cons

Pros-

- Easy to assemble and disassemble
- Lightweight and easy to carry around
- Affordable



Solution 2-Pros and cons

Cons-

- May scratch car windows
- Make car appear unsightly





Generating Ideas



Idea 1: Water Cooling

Add a water cooling system inside the car to allow water to flow through the bodywork(not only to cool the engine but also in between the interior of the car and the aluminium exterior of the car) constantly only when the car engine is running



Idea 1: Water Cooling; Pros and cons

Pros:

- The bodywork of the car will be very thick thus reducing the chance the inhabitants of the car get seriously injured or killed during car accidents due to the thick bodywork of the car preventing sharp debris from piercing through or to reduce the accident impact.
- The weight of the cars will be increased due to the thick bodywork thus increasing the weight and downforce of the car on the road slightly, thus increasing the car's cornering speed very slightly



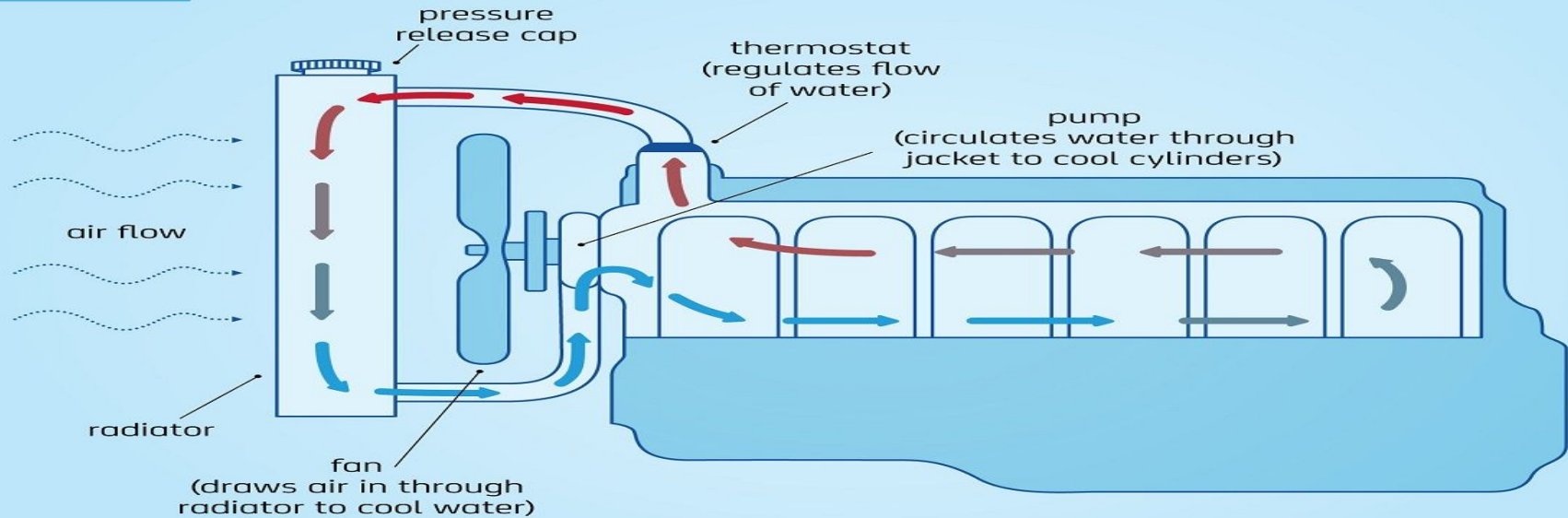
Idea 1: Water Cooling; Pros and cons

Cons:

- The car would be more expensive and costly to make and take a longer time to make as well

Idea Generation 1

CAR COOLING SYSTEM





Idea 2: Material Layering of Car

The material layering of the car would consist of three layers. The first layer would be aluminium foil on top would be aluminum foil and the second layer would be cotton wool and the third cling wrap. The aluminium will be used to reflect the infrared light away and the cotton, being a bad conductor of heat, will reduce heat gain from the surroundings into the car.



Idea 2-Pros and Cons

Pros-

- Less heat absorbant function already built into car.
- The bodywork of the car will be very thick thus reducing the chance the inhabitants of the car get seriously injured or killed during car accidents due to the thick bodywork of the car preventing sharp debris from piercing through or to reduce the accident impact.



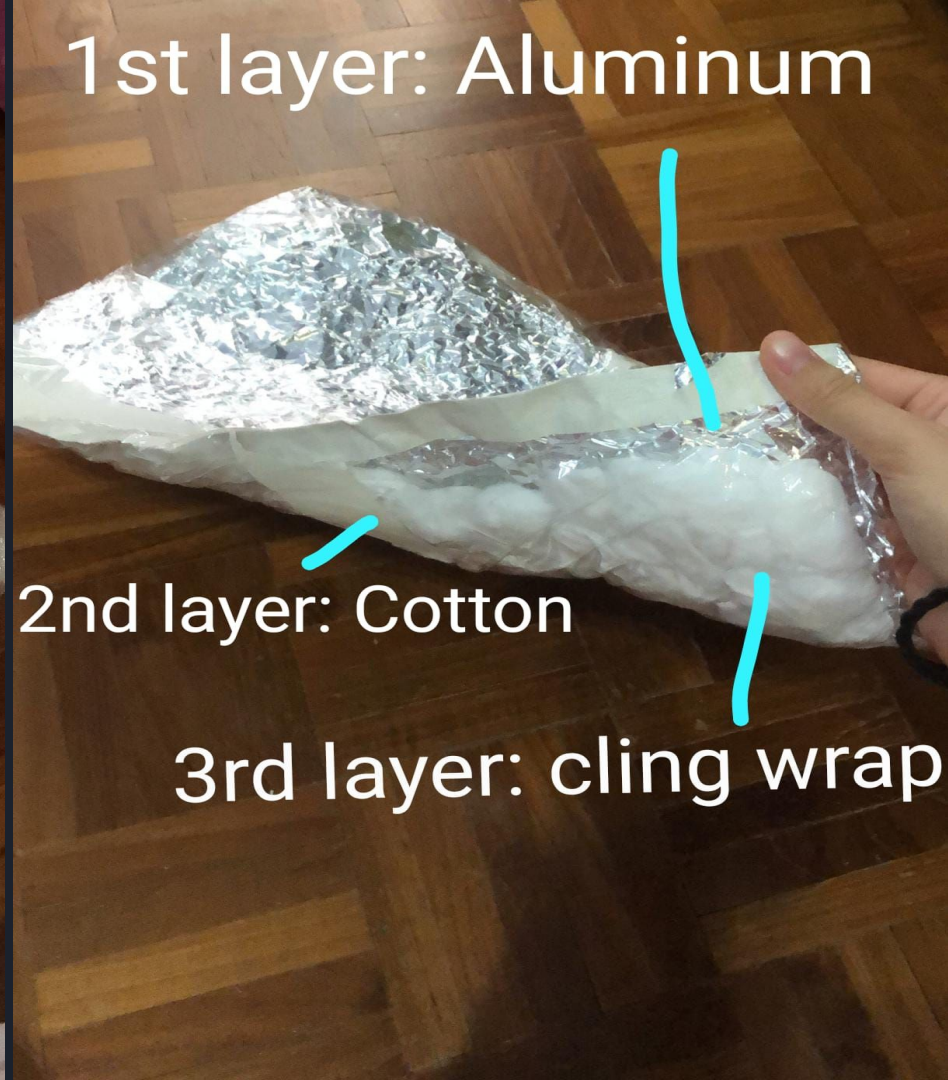
Idea 2-Pros and Cons

Cons-

- Reworks material and model of car, unable to use on existing cars.
- If were to really use, it would be expensive to make such a product



1st layer: Aluminum



2nd layer: Cotton

3rd layer: cling wrap



Criteria for Checking: TAT

Temperature of car interior

Affordability of solution

Time taken to reach the desired temperature



Idea 1: Water Cooling

<i>Criteria</i>	<i>Importance (The higher the better)</i>	<i>Rating</i>	<i>Weighted Total</i>	<i>Combined total</i>
Ease Of Use	1	10	10	43
Cost	2	3	6	
Efficacy	3	5	15	
Durability	2	6	12	



Idea 2: Material Layering of Car

<i>Criteria</i>	<i>Importance</i>	<i>Rating</i>	<i>Weighted Total</i>	<i>Combined Total</i>
Ease Of Use	1	10	10	67
Cost	2	6	12	
Efficacy	3	7	21	
Durability	2	7	14	



Final Statement

After evaluation of both ideas and considering most of the factors, we have decided to go ahead with Idea 2 because it would fit the criteria of most typical customers as it has a higher efficacy rate (which are most customers' number one priority) and would be more aesthetically pleasing than option 1 ; hence, despite the predicted high production and installation price, we feel that most clients would prefer option 2 to option 1.

****Resolution to select Option 2 as the design to develop and adapt carried.***

The End

