Project Deliverable C: Design Criteria and Target Specifications

German Soublette
Defne Oguz
William Hickey

Abstract

The main objective for this project deliverable will be to determine the design criteria we consider to be the most important when starting with our initial design. After defining our prioritized design specifications and criteria, we will proceed to describe what the research of the market for products in this category tells us, which will help us understand what the market where we are going into is telling us about the type of products the consumers have already access to. We will then proceed to mention our target specifications which will contain the technical specifications with somewhat accurate numbers for attributes such as dimensions and weight of the product for example. Lastly, we will reflect on the way the client meeting helped us answer some of our inquiries and how it affected our design specifications.

Table of Contents

Introduction

As we have seen in our lecture portion for this class, during the empathizing phase of the product development and design process, it is imperative to come to a proper definition of those aspects that are a priority in our clients' mind, this is so that those prioritized specifications can be the ones brought to fruition at a very early stage. If we address those first then the client will see that our design is going in the right direction. Another important aspect of developing a product in a specific market is understanding the competition, this will help us to bring some diversity and a different approach for a problem for which there has already been attempts in terms of a solution. When we look at other products that already exist we can make a clear point of which characteristic not to replicate, but on the other hand we can also find the things that have not been done and implement those so that we can give our product something to entice our potential customers. Finally, after considering all of those things mentioned above, we can come to a set of technical specifications that will be the draft for our dimensions, sizing, power aspects and such, these will be the very basis or clean slate where we will begin our design.

Prioritized Design Criteria

- The device will have sound and/or lights to alert those passing by.
- The device will send notifications to the parent(s)/guardian's smartphone.
- The device will have a temperature sensor which will be the main switch for the notifications and alarm system.
- The device will have its own battery system.
- The device will use GPS signals.
- The cost of the device will be kept under $50.
- The device will also have a motion sensor to detect movement regardless of the temperature.
- The device's batteries will not be rechargeable

Technical Benchmarking

The client initiated this project to prevent hot car deaths. The projects main goals are:

- Audio /Visual notification
- Temp/motion notification
- Cost of less than $50
- Internal replaceable battery

As the project team we have chosen benchmarking for the basis of improving our projects outcomes by utilising existing comparable market products to learn from and quickly implement change.

Industry Competition

The team will benchmark based on the following types of competitors within the industry to ensure an average sampling that will be sufficient to determine a benchmark. The score will be out of 5 (0 for worst, 5 for best)

Intermediate: The Tata pad

Pros	Cons
Multi level alarm system(Campbell, J. 2021)	If smartphone dies the alarm system is triggered (Tata. 2021)
IOS and android compatible app (Tata. 2021)	If child is left in car while running alarm will start to trigger(Tata. 2021)
Internal replaceable battery (Tata. 2021)	

Indicator	Score
Audio	4
Visual	0
Temp sensor	0
Force sensor	5
Cost	3

Best in Class: Ride and remind

Pros	Cons
Multi level alarm system (W., & Bradford, A. 2021)	High price(W., & Bradford, A. 2021)
Not smartphone dependent (W., & Bradford, A. 2021)	Requires pro installation(W., & Bradford, A. 2021)
Loud alarm system(Horn)(W., & Bradford, A. 2021)	

Indicator	Score
Audio	5
Visual	0
Temp sensor	0
Force sensor	5
Cost	1

Most economical: Steel mate

Pros	Cons
2 sensors to ensure no false alarms (W., & Bradford, A. 2021)	No internal battery (W., & Bradford, A. 2021)
Simple installation (W., & Bradford, A. 2021)	Alarm system is contained within the car(W., & Bradford, A. 2021)
	3 separate parts making the product easy to displace (W., & Bradford, A. 2021)

Indicator	Score
Audio	3
Visual	3
Temp	0
Force sensor	4
Cost	5

Methods of Collection

The team obtained hard data from the design of the product to compare the outcome of the team's product design. This information was collected through product description, patten design and manufacturing specs.

Industry Average calculated based on data collected above (intermediate, best in class and industry disruptor); score to be used in data analysis below to benchmark against team product

Indicator	Avg ind. score
Audio	4
Visual	1
Temp	0
Force sensor	3
Cost	3

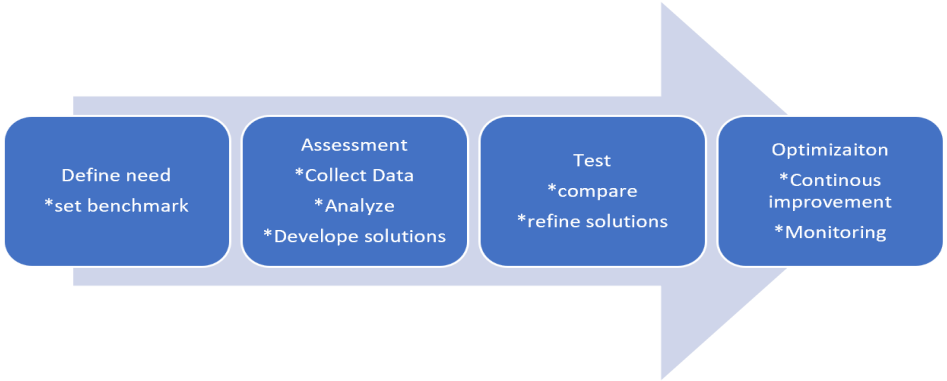
Data Analysis

Criteria	Indicator	Benchmark	Unit	Parameter	Industry Benchmark Score	Product Score	Difference (+/-)
Technical	Audio	Decibel level	Db	(80-100)	4		
	Visual	Flashing lights	NA	NA	1		
	Temp	Tempera-ture sensor	C^{O}	(-55 - 150)	0		
	Force	Force sensor	N	(0-1KN)	3		
	Cost		$		3		

Results

The team will analyze the data collection to:

- identify opportunities for narrowing the gap between current and desired measures.
- implement activities recommended to close the gap.
- measure progress towards achieving targets, evaluate and re-calibrate measures, adjust activities as required, and repeat the process.



Technical Benchmarking Model:

Target Specifications

Max. length: 10 inches
Max. width: 5 inches
Max. height: 1 inch
Max weight: 1 lb
Max. power input: 9V
Max. power output 5V
Speaker/Buzzer: 8 Ohms 5 Watts
Heat sensor: -55 to 120 degrees Celsius, 5V
Pressure sensor: 20 to 50 lbs, operating with a 9V

Reflection on the Client Meeting

During our client meeting, first our client made a brief presentation about the origin of the project and the demanded solution. At the beginning of the presentation we were able to see the many cases of children and pet deaths in the news, newspapers all around the world; this part encouraged us to empathize with the client and also understand what the problem is. After, the client himself defined the problem generally; but as a group, in the deliverable B, we have defined the problem in a more technical way. The client meeting was in two parts; after the presentation; we had a question-answer session with our client. While asking questions to our client; the format of the product was clarified (eg. an alarm/a sensor system; can be connected to an app); it has also helped us to understand where the product will be placed in the car and in the marketplace. We have redefined our users; and also gathered information about our prototype and also the power source. Thus, our first client meeting helped us to get a better understanding of the wanted solution; and all the other possible solıtions.

References

1. **Campbell, J. (2021, January 15). *The Tata Pad and tata band: A car seat alarm system that alerts parents*. Safety.com. Retrieved October 8, 2021, from https://www.safety.com/an-essential-reminder-for-parents-the-tata-pad-and-tata-band-baby-car-seat-alarm/.**
2. ***Why tata pad? find out why tata pad is the safest baby car seat ALLARM • Tata • getmytata.com*. Tata. (2021, July 6). Retrieved October 8, 2021, from https://getmytata.com/en/why-tata/.**
3. **by, W., & Bradford, A. (2021, August 18). *Devices to prevent leaving kids in the car*. SafeWise. Retrieved October 8, 2021, from https://www.safewise.com/car-seat-alarm/#1.**