

# **ENGINEERING DESIGN - END SEMESTER PROJECT**

## **TEAM MEMBERS :**

SECTION:M1

S KARTHIKEYA - 125158053

P D NAVEEN CHAND - 125002021

K PARAMESWAR REDDY- 125160072

## **PRODUCT NAME:**

**SENSORED AIRPODS:**



## **TABLE OF CONTENTS:**

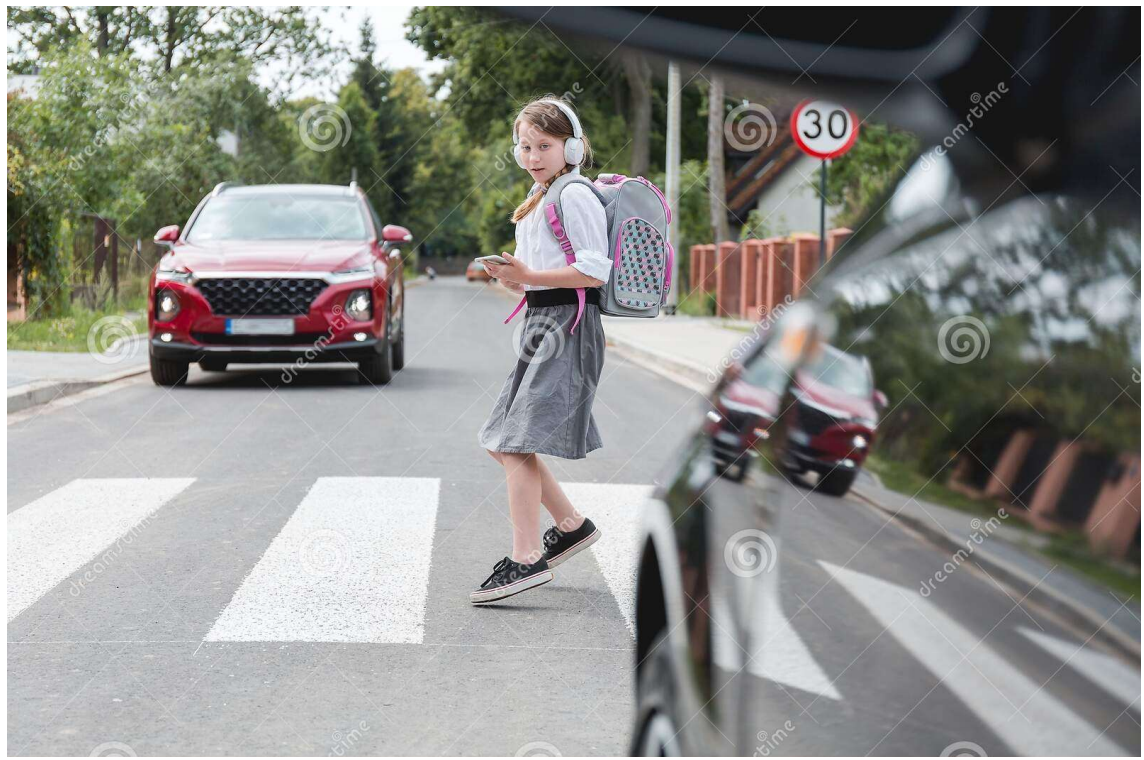
- Identification of need
- Problem statement
- User requirements
- Constraints
- Considerations
- Design problem
- Specifications
- House of quality
- Kano model
- Metric matrix
- Functions and sub functions
- Morphological chart
- Criteria for selection
- Decision matrix
- Sketch
- conclusion

## **IDENTIFICATION OF NEED:**

1. To listen music by pairing with smart phones and laptops through Bluetooth mode
2. Airpods remain true-wireless earbuds, comfortable fit, decent sound, active noise cancellation and compelling feature set.
3. The main aspect of sensored airpods is to give signal or intimation when accident is going to happen

## **PROBLEM – STATEMENT:**

Main perspective point of dealing with sensors is to protect ourselves from danger like road accidents...etc. So, they are attached to airpods.



## **USER REQUIREMENTS:**

- a) to perform activities like attending calls without opening the phone
- b) automatic volume controller based on outside sound noise
- c) it should be affordable and easily carriable

## **constraints:**

- a) if the case provided for airpods is lost , then it is difficult to charge
- b) since airpods pair to phone by Bluetooth, phone battery will generally lose charger fast
- c) lack ambient listening mode

## **considerations:**

sound quality with one tap sensor

Good active noise cancelling

The pressure-sensitive stems for controls

Portable charging case (Lightning/wireless)

## **Design problem:**

- a) size of airpods are very tiny and left airpod cannot fit to right ear & vice-versa
- b) if one airpod is lost, then sensor may not work
- c)no waterproofing or workout features
- d)Bluetooth is must for the connection

## specifications:

<b>Type</b>	Sensor airpods
<b>Form-factor</b>	Earbuds
<b>Dimensions</b>	Airpods(each):0.65*0.71*1.59 inches (16.5*18.0*40.5 mm) Charging case:1.74*0.84*2.11 inches (44.3*21.3*53.5 mm)
<b>Weight</b>	Airpods(each):0.14 ounce (4 g) Charging case:1.34 ounces(38g)
<b>Resistance</b>	No waterproof
<b>Features</b>	-automatically on,automatically connected -one-tap setup for sensor -quick access to google with double tap -more than 24-hour battery life with charging case
<b>Quality</b>	-rich , high-quality audio and voice
<b>Connection</b>	Bluetooth 4.0
<b>Case</b>	Lightning-connector
<b>Power</b>	-non-removable Li-ion battery -Airpods with charging case more than 24 hours listening time upto 11 hours talk time -Airpods(single charge) upto 5 hours listening time upto 2 hours talk time -15 minutes in the case equals 3 hours listening time or over an hour of talk time

## HOUSE OF QUALITY:

# HOUSE OF QUALITY:

9 - Strong

5 - medium

3 - Weak

0 - Very Weak

Importance

1 2 3 4 5

+ → positive

- → Negative

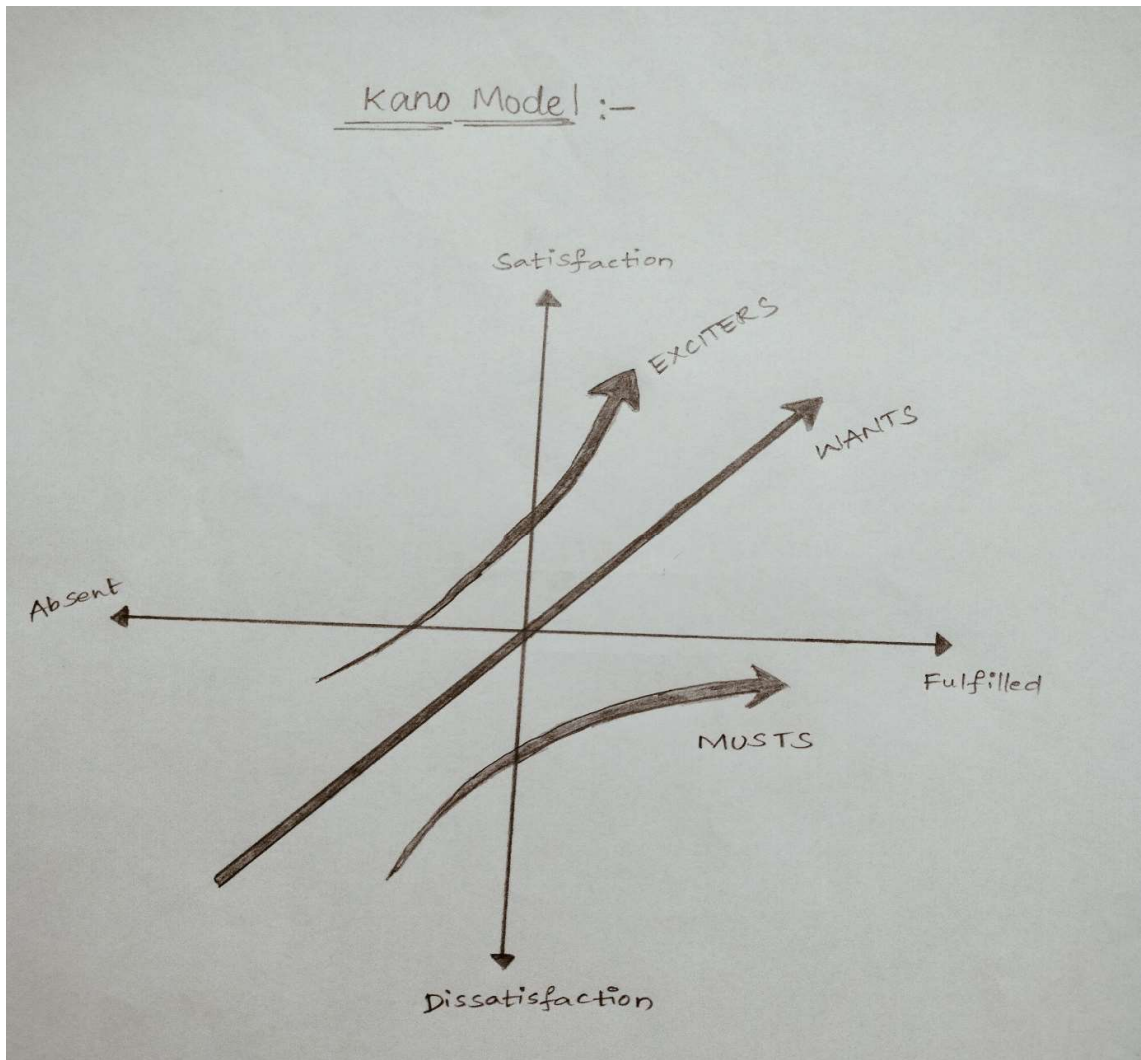
++ → Strongly positive

-- → Strongly negative


Sensor Airpods	Customer Attributes	Technical Specifications										
			Stylish jury	Weight	Size	Noise output (speaker)	Distance (m)	Price	Battery Capability	Power consumption	Durability	Importance
	Stylish		9	9	5	0	0	9	3	3	9	5
	Light Weight		9	9	9	5	3	9	5	0	5	5
	Sound Quality		5	0	0	9	5	3	3	5	9	5
	Long Range		0	0	0	5	9	5	9	3	5	4
	Self controlling		0	0	0	3	9	0	0	0	9	3
	High Quality finish		9	5	9	3	0	9	5	5	9	3
	Durable body		9	9	3	3	5	9	5	5	9	4
	Long battery life		3	0	3	0	0	5	9	9	5	5
	Water Proof		0	3	5	0	0	9	9	5	3	4



## KANO MODEL:



### **Must:**

To listen music with privacy.

### **Wants:**

Charging case to place the airpods safely.

Volume controller.

## Exciters:

Sensor is attached to alert you in danger.

### *Metric matrix:*

Needs	length	weight	material	shape	Durability
To hold with ease	✓	✓		✓	
Not to harm ears			✓	✓	✓
Waterproof			✓		
Affordable price			✓		
To listen with best quality sound					✓
Sensor			✓		✓

## Functions:

- Sensor functioning is one of the main function.
- Sound quality to get calls, signals , voice,...etc.
- Durability , long lasting battery.
- Avoid outer noises.
- Unbreakable material .



### Sub-functions:

- Sensor start working when danger is within 10-15mts
- High quality of sound gives best listening experience
- Long battery gives more using time
- No noise disturbances are allowed

### Morphological chart :

Functions	Mean 1	Mean 2	Mean3
Compatibility	One brand of mp3 player	Multiple brands	-
Shape	earbuds	Earbuds with over ear piece	Canalphones(in ear)
Material of airpod	Silicone rubber	elastomate	Foam
Water resistance material	plastidip	polypropylene	Mylar
Power	Charger (Plugs into outlet)	Container with charger	Docking station
User interface	Buttons on airpods	Be controlled by mp3 player	Mix: some buttons on airpods ,others mp3

<b>Battery</b>	Goes in both airpodes	Goes in one airpode	-
----------------	-----------------------	---------------------	---

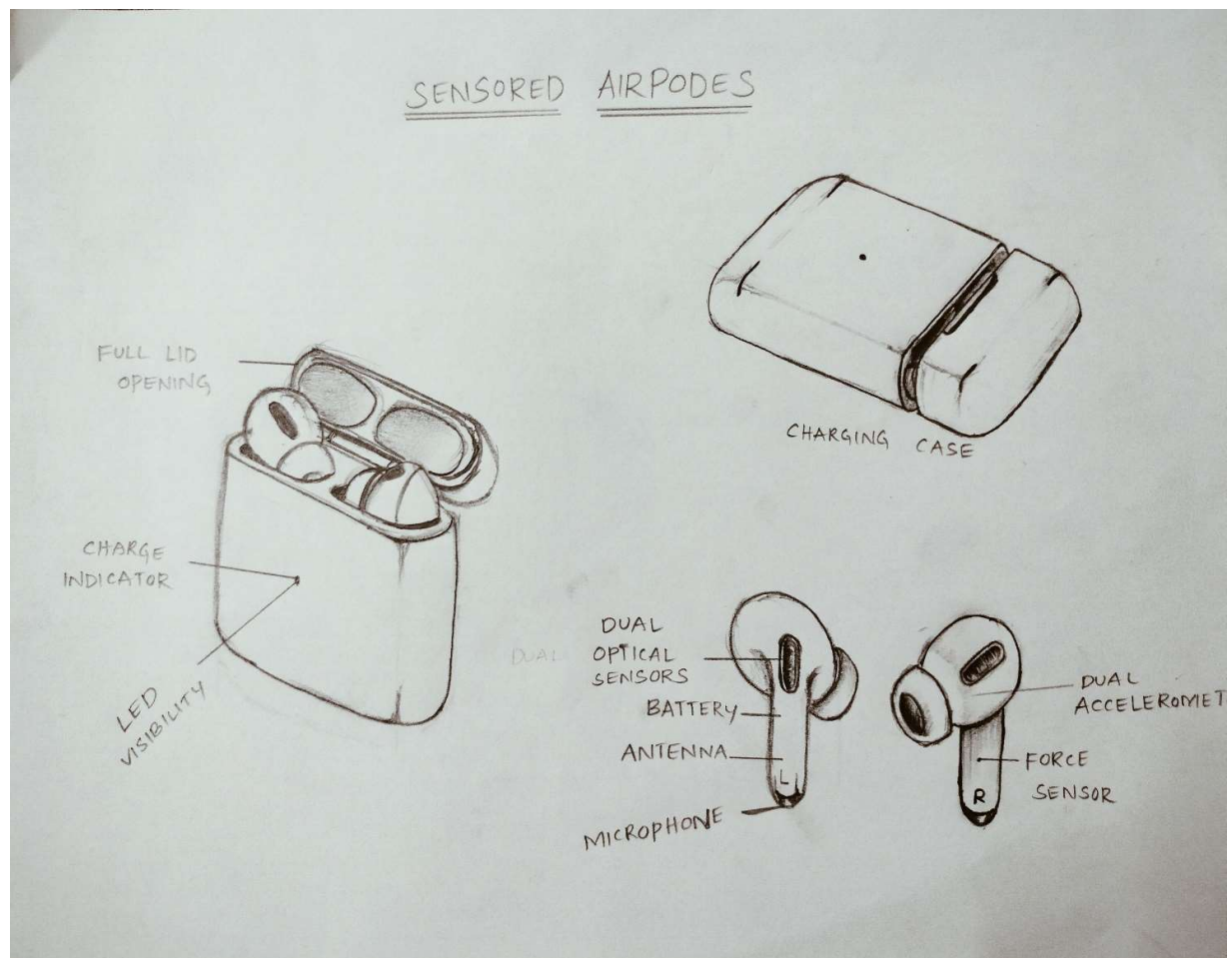
### **Criteria for selection:**

- 1.compact size
- 2.good sound performance
- 3.long battery life
- 4.best sensor working
- 5.good material
- 6.considerable price

### **Decision matrix:**

function	Mean 1	Mean 2	Mean 3
<b>Compatibility</b>		✓	
<b>Shape</b>			✓
<b>Material of airpod</b>	✓		
<b>Water resistance material</b>		✓	
<b>Power</b>		✓	
<b>User interface</b>			✓
<b>Battery</b>	✓		

## SKETCHES:



## **Conclusion:**

This product ( sensor airpods) is an innovative model for airpods.

The functions installed in this airpods like signals, optical sensors are impressive to users.

Customers will become satisfy after using this product

We will become happy that the sensors saves one life .