ENGINEERING DESIGN

Smart Table

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INTRODUCTION

We use table in our daily life everywhere . A table is used for a variety of purposes like eating , reading , writing , etc . It provides a support for keeping books , writing , running laptops and doing important works.

Smart Table has a large surface area to accommodate different things and perform different activities.We need an equipment to perform all of this functions in a single frame which will make our work easy.
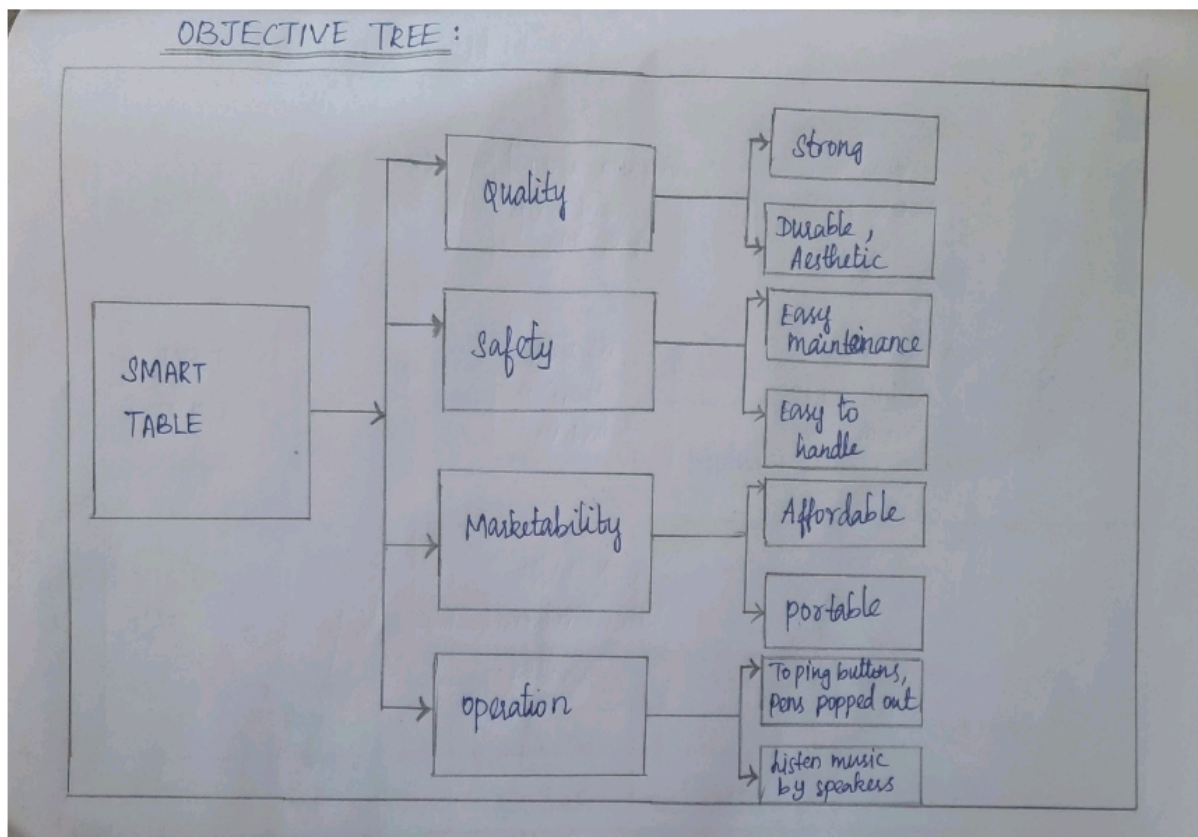
In this scenario a Smart Table with all of the combined features can be designed.
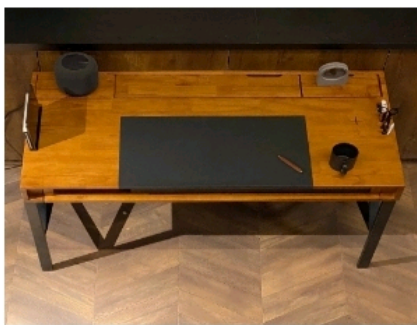
OBJECTIVE

- The main objective of designing this smart table is to provide comfort to students while studying and providing more features compared to normal table.
- To reduce the manual work by the mechanism which make the table to follow the user on its own.

OBJECTIVE TREE

CONSTRAINTS

- It should not be heavy.
- It should be made with Waterproof Material.
- It Should not have less space.

NEED OF A SMART TABLE

- To adjust the height of the table.
- To accommodate different objects in a single table.
- When the table is heavy its not portable.So we need remote control system in table.
- Simple table only provides support without any function.So we need proper functioning of the table.

PROBLEM STATEMENT

- In a simple table we face many problems.
- We cannot have different function such as automatic sensored moving ,automatic adjustment of height,no drawers .
- There is no charging port in a single table.
- The normal table is brittle and can be easily broken.

FUNCTIONS

Primary Functions

- To provide a comfortable space for studying.
- To have a space to keep things and take them whenever necessary (as the upper surface is rotatable we can rotate and keep the things on the surface which will not affect the digital board.

Secondary function

✓ To listen to music while writing assingnmets or record work.
✓ To ping a button, so that pens and other stationary can be popped out.

FUNCTION TREE
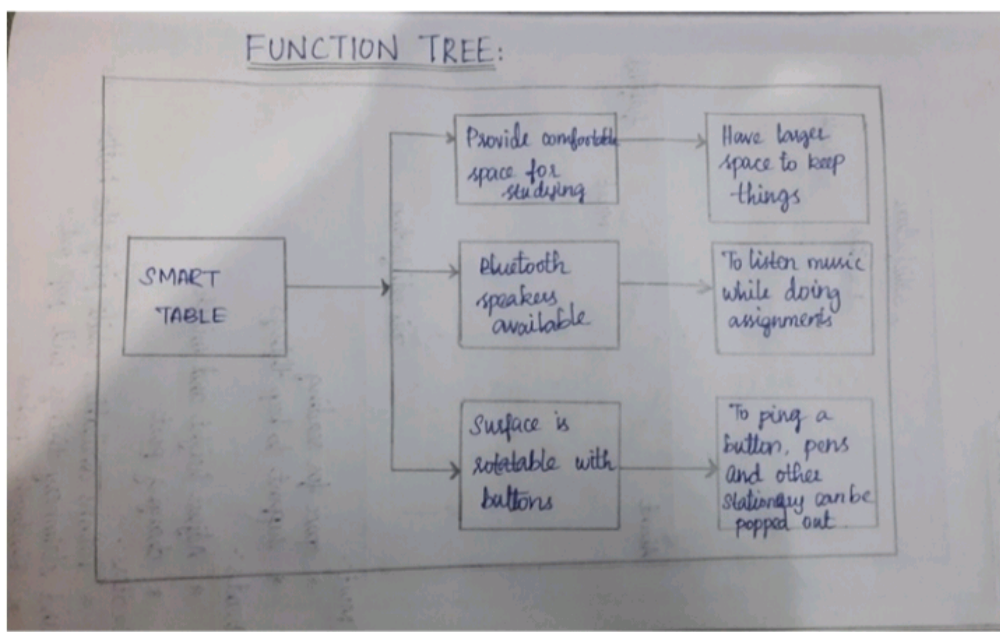
SURVEY

I enquired hostel friends about using smart table concepts.They liked it very much. Total of 25 – 30 students told about the their traditional table and how they are facing issues regarding it. We have explained them about the smart table features and they have showed their willingness to buy it.

- ✓ It is more convenient.
- ✓ It is multifunctional.
- ✓ It is very easily portable.
- ✓ It is more user friendly.
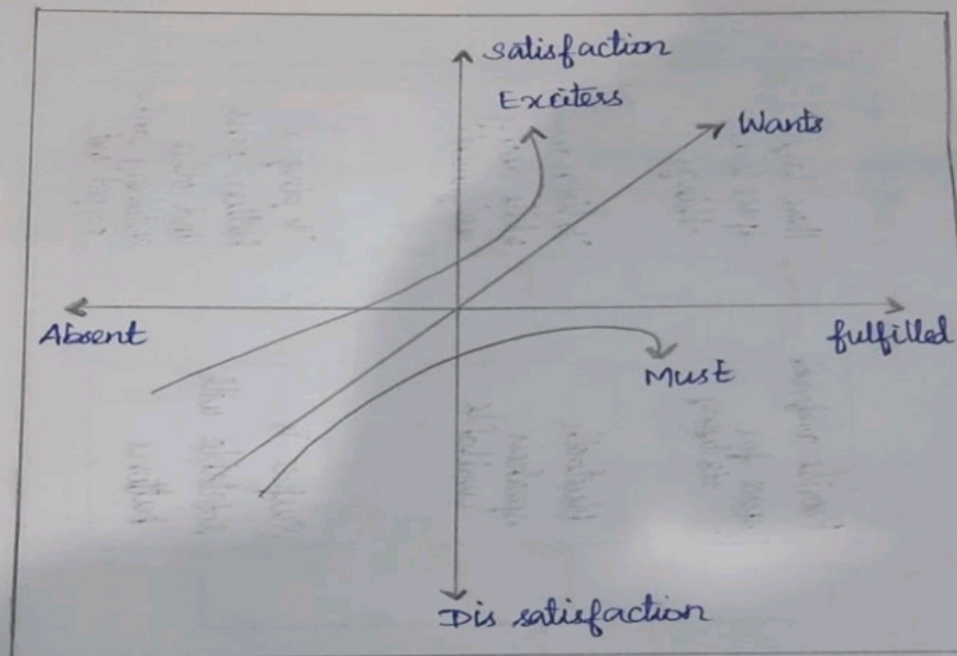
User Requirements

- It should be easily accessible.
- It should require less frequent repairs.
- Colour of smart table should meet the users needs.
- It should not be heavy.
- It should be in affordable price and durable.

JAPANESE QUALITY TOOLS

- In the kano model of quality, design attribute is described

1. KANO MODEL

KANO MODEL:-

Must:-
  * space for reading
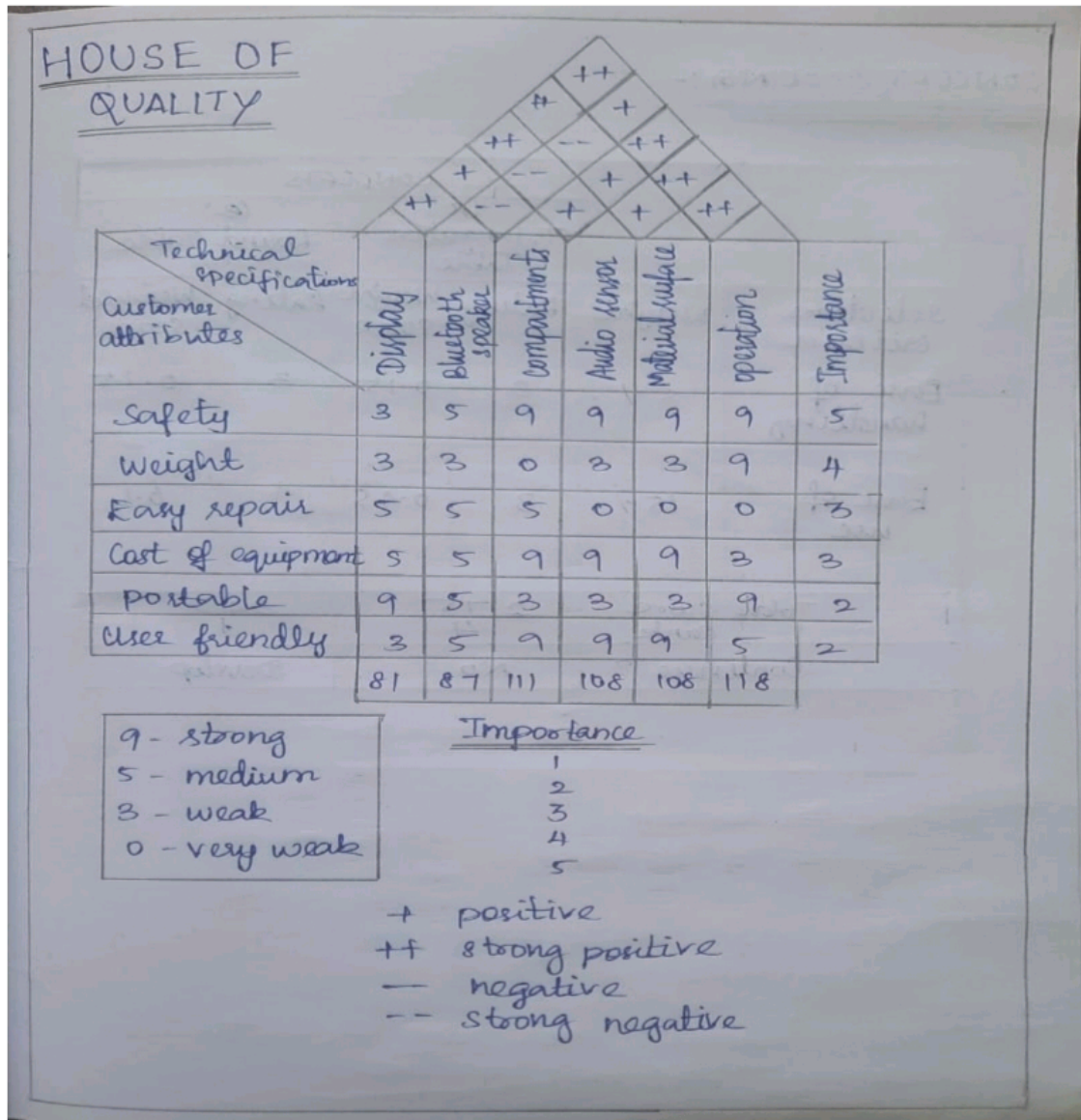 * support to keep things

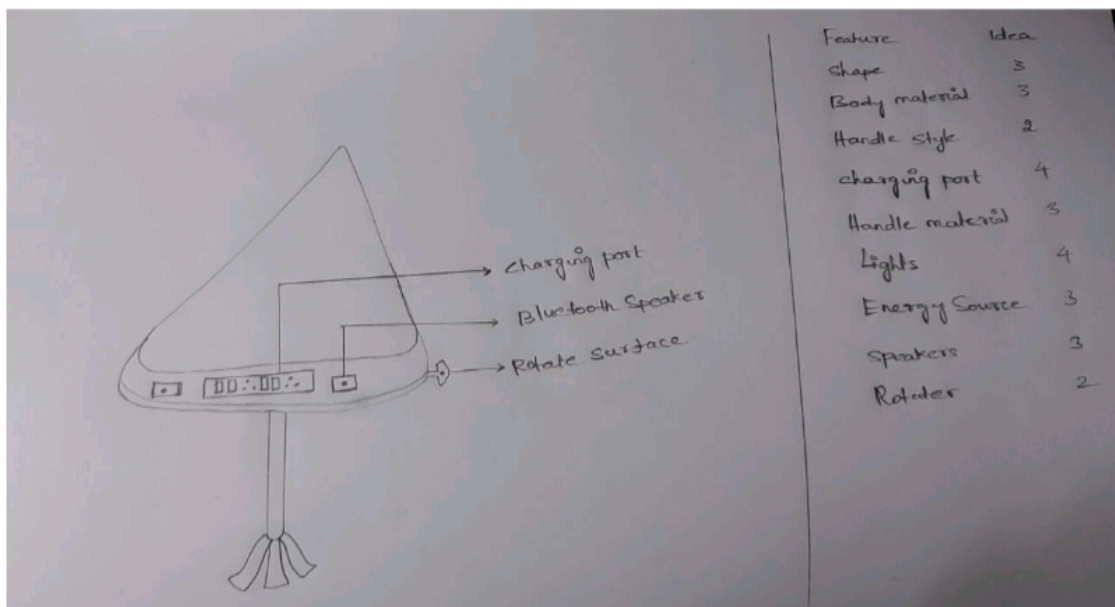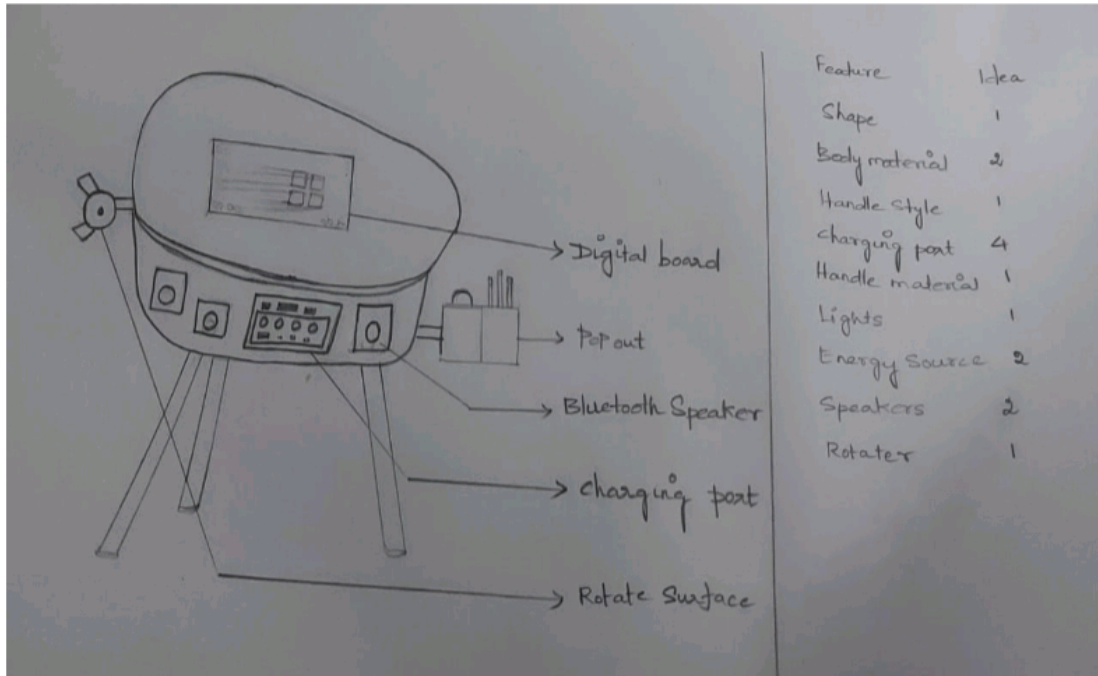**Wants:-**
  * Adjust height and width
  * charging port

Exciters:-
  * Buttons available, while ping the button pens and stationery things will pop out.
  * Bluetooth speakers

2. HOUSE OF QUALITY

HOUSE OF QUALITY

Technical specifications / Customer attributes	Display	Bluetooth speaker	Compartments	Audio sensor	Material surface	operation	Importance
Safety	3	5	9	9	9	9	5
Weight	3	3	0	3	3	9	4
Easy repair	5	5	5	0	0	0	3
Cost of equipment	5	5	9	9	9	3	3
Portable	9	5	3	3	3	9	2
User friendly	3	5	9	9	9	5	2
	81	87	11)	108	108	118	

9 - strong
5 - medium
3 - weak
0 - very weak

Importance
1
2
3
4
5

+ positive
++ strong positive
— negative
-- strong negative

CONCEPTUAL DESIGN

Feature	Idea
Shape	1
Body material	2
Handle Style	1
charging port	4
Handle material	1
Lights	1
Energy Source	2
Speakers	2
Rotater	1

- Digital board
- Pop out
- Bluetooth Speaker
- charging port
- Rotate Surface

Feature	Idea
Shape	3
Body material	3
Handle style	2
charging port	4
Handle material	3
Lights	4
Energy Source	3
Speakers	3
Rotater	2

- charging port
- Bluetooth Speaker
- Rotate Surface

MORPHOLOGICAL CHART

MORPHOLOGICAL CHART FOR SMART TABLE

FEATURE	Alt 1	Alt 2	Alt 3	Alt 4
SHAPE	Round	Triangle	Rectangle	Boat shape
TABLE TOP MATERIALS	Wood	Glass	Metal	Marble
TABLE LEG STYLE	Four Legs	Pedestral	Trestle	X - Base

FEATURE	ALT I	ALT 2	ALT 3	ALT 4
CHARGING PORTS	USB	Wireless	Portable	Adaptor
SPEAKERS	PIEZOELECTRIC	Electro Dynamic	Portable speaker box	
LIGHTS	LED	NEON	Fluroscent lamp	Argon bulbs
Rotator (Adjust height a width)				

CONCEPT SCORING

CONCEPT SCORING :-
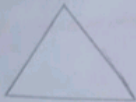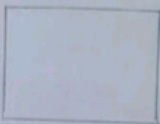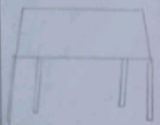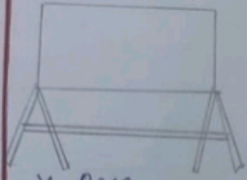
		CONCEPTS			
		(A) Triangular Table		(B) Round Table	
Selection criteria	Weight	Rating	Weight Score	Rating	Weighted Score
Ease of handling	5 / .	3	0.15	3	0.15
Ease of use	15 / .	3	0.45	4	0.6
Total Score		2 75		34 5	
Rank		4		1	
Continue ?		No		Develop	

SCREENING MATRIX

SCREENING MATRIX:

Selection criteria	CONCEPT VARIANTS				
	A	B	C	D	REF
Ease of use	0	0	–	0	0
Ease of handling	0	–	–	0	0
Manufacturing ease	+	–	–	0	0
Portability	+	+	–	–	0
pluses	3	2	2	1	
same	4	3	1	5	
Minuses	0	2	4	1	
NET	3	0	2	0	
RANK	1	3	7	5	
Continue?	Yes	Yes	No	No	

MORPHOLOGICAL CHART -Final

MORPHOLOGICAL CHART FOR SMART TABLE

FEATURE	Alt 1	Alt 2	Alt 3	Alt 4
SHAPE	Round	Triangle	Rectangle	Boat shape
TABLE TOP MATERIALS	Wood	Glass	Metal	Marble
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FEATURE	ALT 1	ALT 2	ALT 3	ALT 4
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Rotator (Adjust height & width)				

CRITERIA FOR BEST CHOICE

Durable   Comfortability

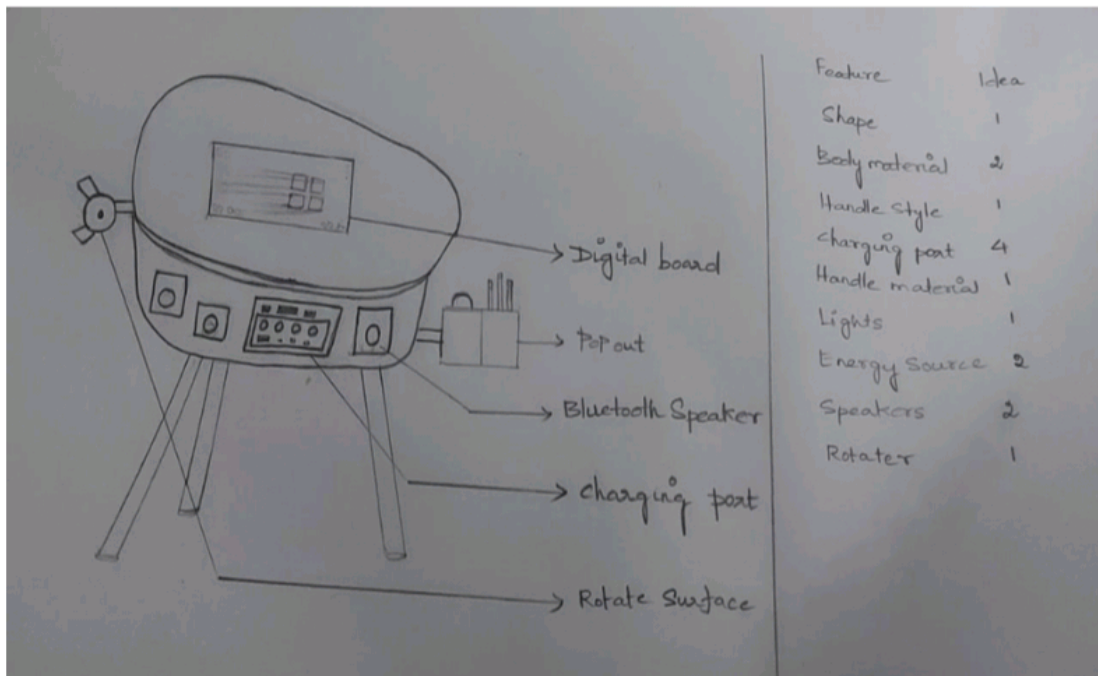Aesthetic   Circular

Maintenance   Sustainability

FINAL DESIGN

CONCLUSION

Our final design is better than other two conceptual design because the circular top ensures less risk of damage to the user . This feature is absent in the other concept.

Bluetooth speakers, pop out, light weight, digital board(to make study notes)

Charging port, adjustable height and rotating surface are the features which make the smart table work more efficient and to be more strong and long lasting compared to the other conceptual design.

Overall, this was one of the best and useful product for the betterment of lives of people.

THANK YOU