

A PRODUCT SYSTEM TO AID PSYCHOTHERAPY IN UNIVERSITY STUDENTS WITH DEPRESSIVE DISORDERS

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DEPRESSION IN INDIA : STATISTICS

9 PERCENT

The percentage of of people in India reported having an extended period of depression within their lifetime.

3.5 PER MILLION

Percentage of Indians who had reported incidents of major depressive episodes (MDE).

35.9 PERCENT

No. of psychiatrists in India per million people

30 YEARS

The average age of the depressed Indian.

10 MILLION

Estimated number of depressed Indians.

UNDERSTANDING DEPRESSIVE DISORDERS

MAJOR DEPRESSIVE DISORDER (MDD)

Is characterized by a pervasive and persistent low mood that is accompanied by low self-esteem and by a loss of interest or pleasure in normally enjoyable activities.

MINOR DEPRESSIVE DISORDER

Is a mood disorder that does not meet full criteria for major depressive disorder but in which at least two depressive symptoms are present for two weeks.

CURRENT SCENARIO IN INDIA :

Mental illness is already high in the age group 30–40 , minor depression if not properly addressed could easily deteriorate into major depression.

SYMPTOMS OF DEPRESSIVE DISORDERS

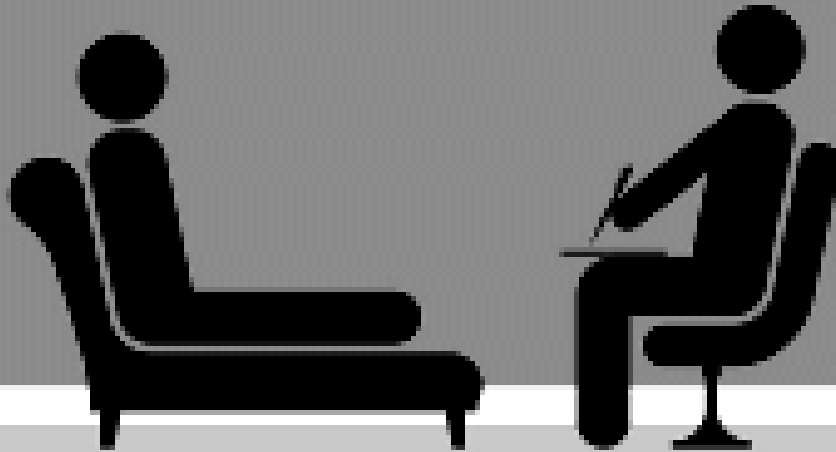
- Fatigue or loss of energy
- Feelings of worthlessness or guilt
- Impaired concentration, indecisiveness
- Insomnia or hypersomnia
- Anhedonia
- Restlessness
- Recurring thoughts of death or suicide
- Significant weight loss or gain



INSIGHTS FROM TARGET USER INTERVIEWS

- i. Loss of control over their lives in general.
- ii. Inability to concentrate on the task at hand.
- iii. Irregular sleeping and dietary patterns.
- iv. Withdrawal from social interactions
- v. Feelings of loneliness and exclusion.
- vi. Recurring heaviness in their heads.
- vii. SSRI Dependence.

KEY INSIGHTS FROM INTERVIEWS WITH EXPERTS



1. In order to successfully develop a product that aids depression , a very tight user- group must be defined.
2. Severe depressive disorders require professional psychiatric / psychological assistance.
3. Relapses in patients suffering from depressive disorders are quite common.
4. Reinforcement learning may be employed to affect behavioral change in subjects.
5. Cognitive Behavioural Therapy (CBT) involves equipping the patient with the skills required to deal with depressive disorders

IDENTIFYING DESIGN OPPORTUNITIES AT A SYSTEM LEVEL

FORMULATING DESIGN STRATEGY

DESIGN OBJECTIVE

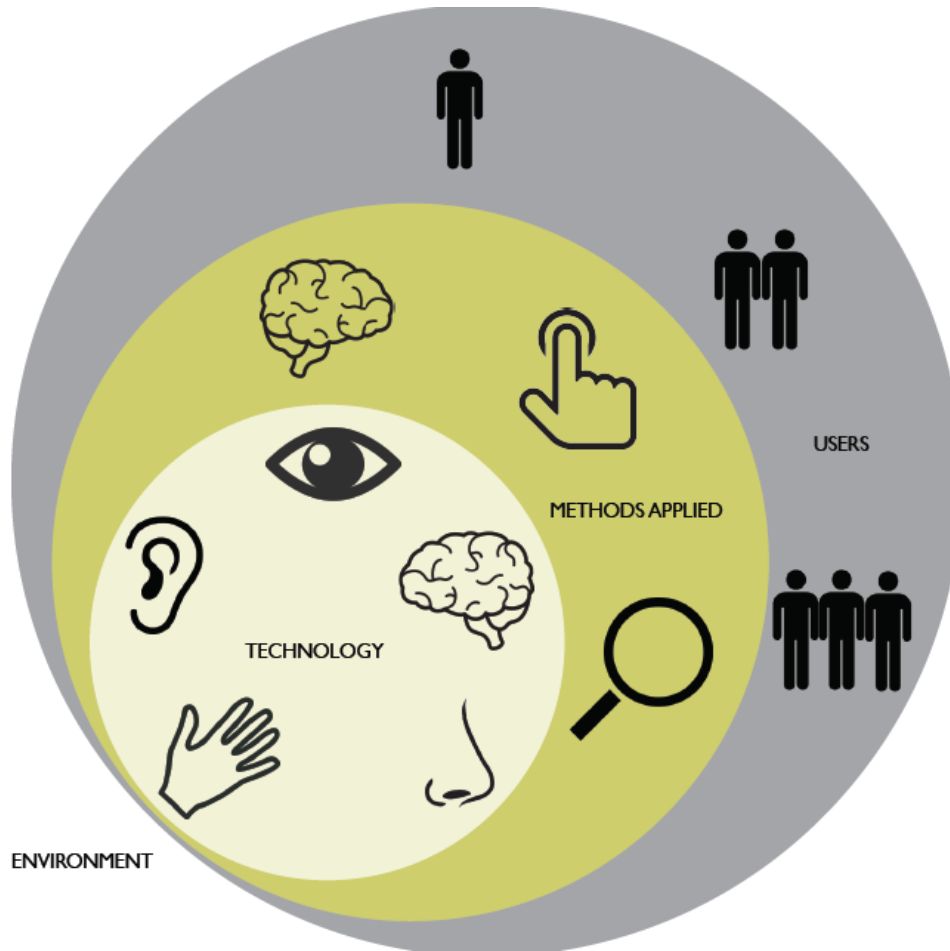
To design a product system that is supportive to psychotherapy and aims to remedy symptoms of mild depressive disorders in college students.

DESIGN BRIEF

The following check-points are to be incorporated into the product system to be designed:

- I. Incorporate features derived from behavioral therapy.
- II. Monitor & encourage a healthy diet and sleep cycle.
- III. Incorporate multi-sensory stimuli to relieve stress ,aid sleep & relax.
- IV. Encourage communication & social interactions by the user to support groups.
- V. Allow for portability ,recharging & synchronization to users devices

IDENTIFYING THE SYSTEM



USERS:

1. PRIMARY : UNIVERSITY STUDENTS
2. SECONDARY : THERAPIST / COUNSELLOR
3. TERTIARY : TRUSTED FRIENDS/FAMILY

METHODS APPLIED:

1. SEMANTIC THEORY
2. POSITIVE REINFORCEMENT LEARNING
3. EXPERT EVALUATION

APPLIED TECHNOLOGY:

1. VISUAL SUB-SYSTEMS
2. AUDITORY SUB-SYSTEMS
3. TACTILE SUB-SYSTEMS
4. OLFACTION SUB-SYSTEMS
5. POSITIVE REINFORCEMENT APP

ENVIRONMENT:

1. PRIVATE SPACES : HOME / HOSTEL
2. PUBLIC SPACES : COLLEGE / CLASS
3. INSIDE BAGS - TO CARRY AROUND

DEVELOPING A FRAMEWORK TO TRIGGER BEHAVIOUR CHANGE THROUGH REINFORCEMENT LEARNING

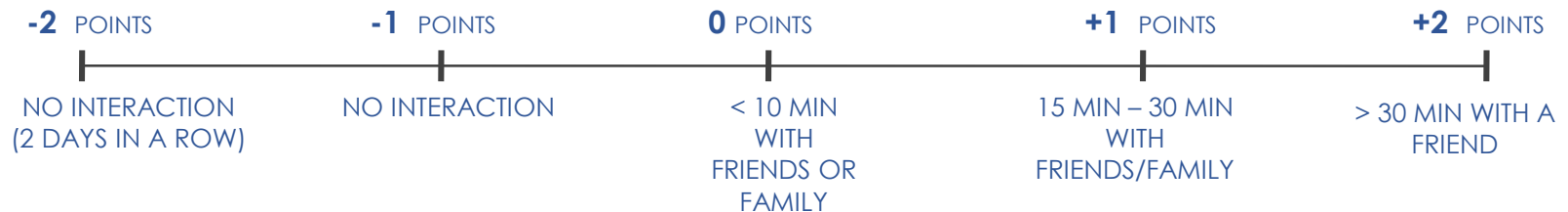
DEVELOPING A FRAMEWORK FOR BEHAVIOR CHANGE THROUGH REINFORCEMENT LEARNING

A) DIFFERENTIAL SCALES FOR REINFORCEMENT STIMULUS

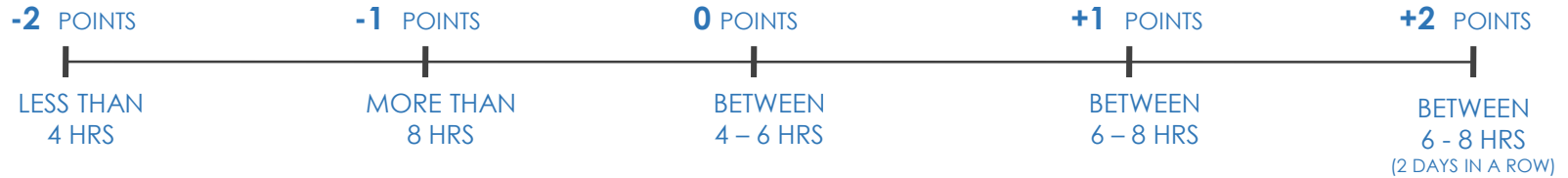
EXERCISE & WELL-BEING SCALE



SOCIAL INTERACTIONS SCALE



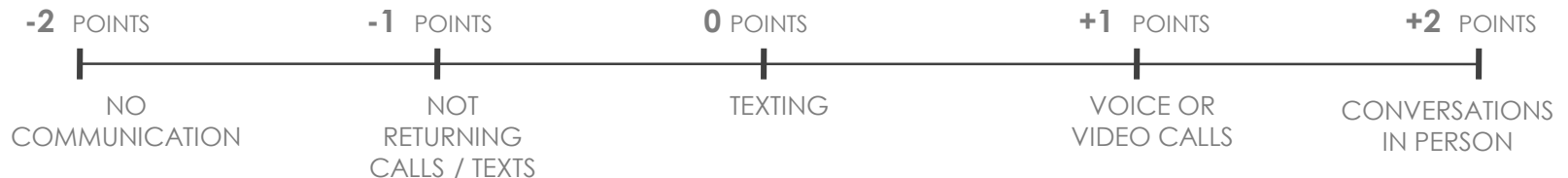
SLEEP PATTERNS SCALE



DIETARY PATTERNS SCALE



COMMUNICATION SCALE



B) A DEVICE TO GENERATE MULTI-SENSORY STIMULUS FOR POSITIVE REINFORCEMENT

- | | | |
|------|------------------------------|---|
| i) | Rewarding Visual Stimuli : | Ambient Glows , Mood Lighting ,Serene Visuals . |
| ii) | Rewarding Audio Stimuli: | Ambient Home Noises ,
Binaural Waves to Relax & Aid Sleep ,
Guided Meditation, Audiobooks |
| iii) | Rewarding Olfaction Stimuli: | Aroma diffusion based on Aromatherapy |
| iv) | Rewarding Tactile Stimuli: | Massaging Vibrations , Tactile Play Value |

C) LINKING POSITIVE SCORES TO TIME-BASED REWARDS

DAILY SCORE		< 0 Pts	0-5 Pts	5 Pts	5-10 Pts
i)	Visual Stimuli activated for	+0 hrs	+1 hr	+2 hrs	+3 hrs
ii)	Audio Stimuli activated for	+0 hrs	+1 hr	+2 hrs	+3 hrs
iii)	Olfaction Stimuli activated for	+0 hrs	+1 hr	+2 hrs	+3 hrs
iv)	Tactile Stimuli activated for	+0 hrs	+1 hr	+2 hrs	+3 hrs

DEVELOPING THE REINFORCEMENT LEARNING APP

SCORING PARAMETERS	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
DIETARY PATTERNS	1	-1	2	0	1	-1	0
SLEEP MANAGEMENT	1	-1	1	1	0	-1	1
COMMUNICATION	0	0	1	1	2	1	-1
EXERCISE & WELL-BEING	1	0	0	-1	-1	2	0

3.a Update Back End with scores 3.b Generate Other Sections

REWARDS

PROGRESS SUMMARY

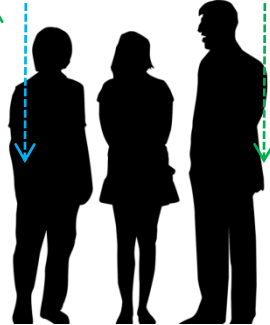
STATISTICS

5. Activate time-based rewards for Positive Points.

1. Request for Scores



2. Validated Scores

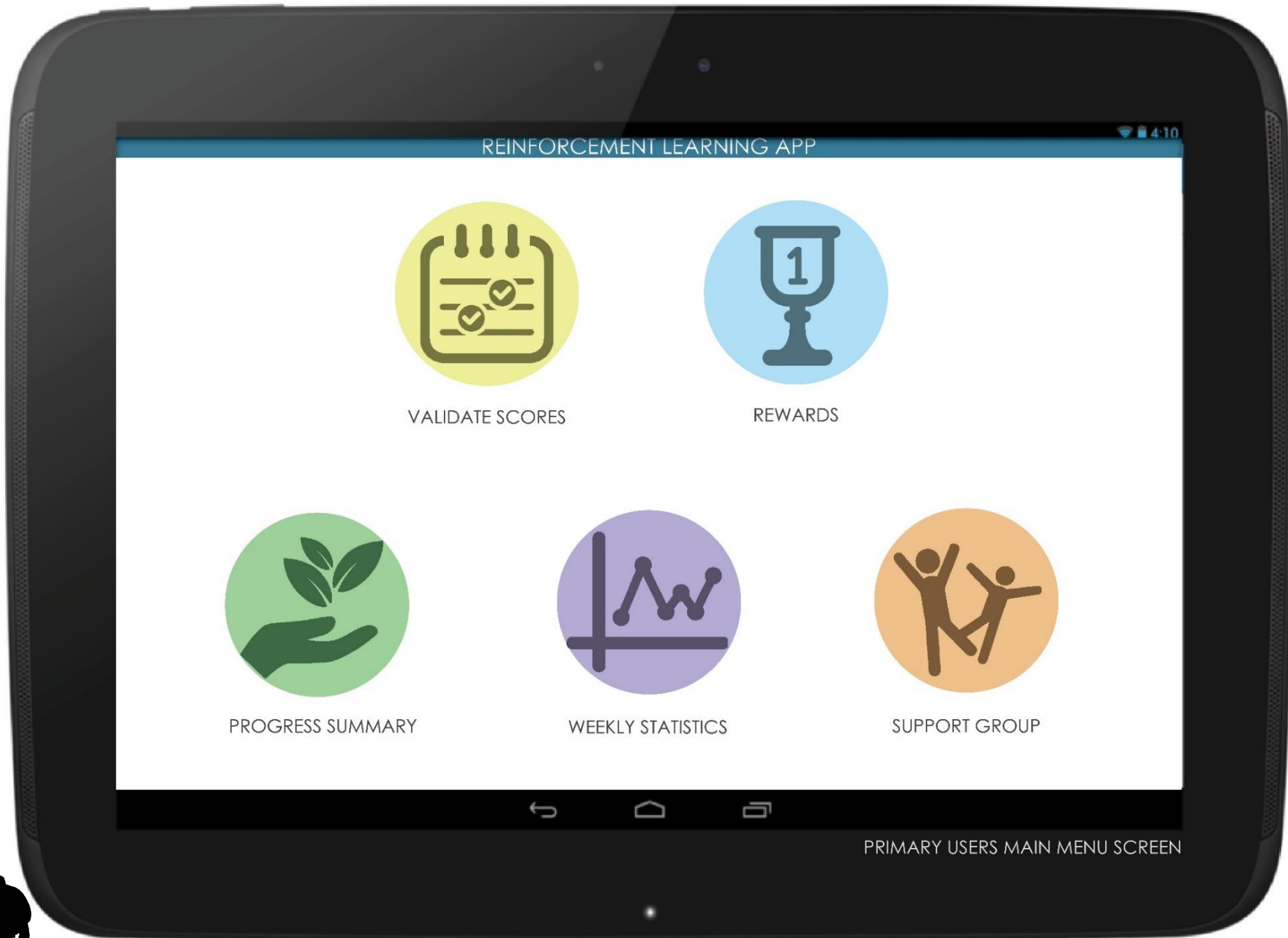


4a. Overall Summary

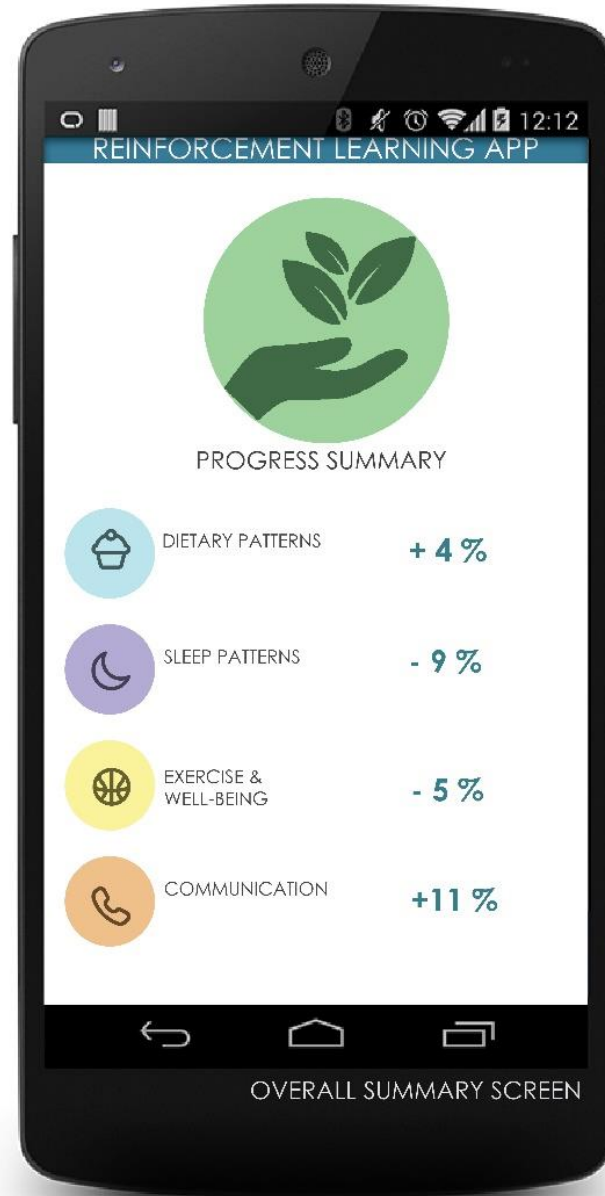
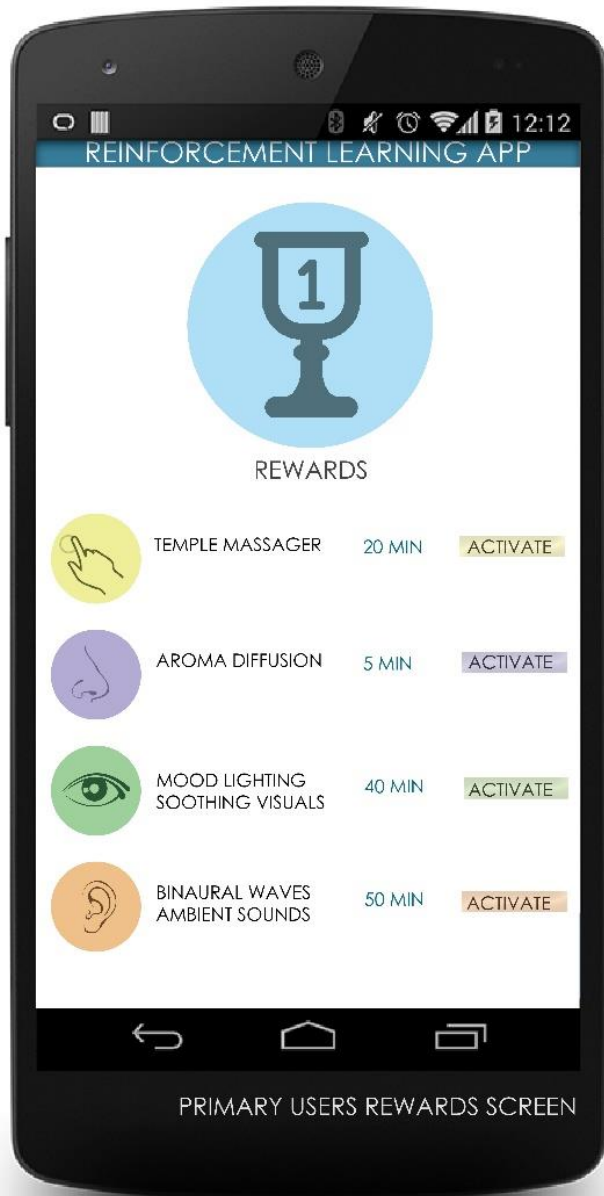


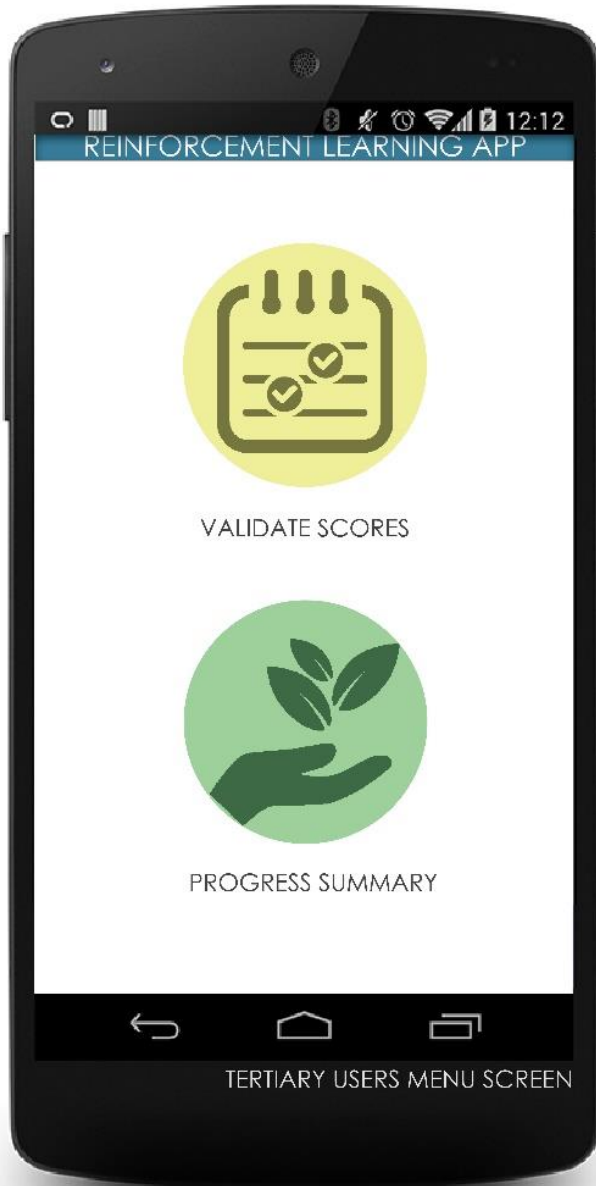
4a. Overall Summary of Progress
4b. Comparison and Stats





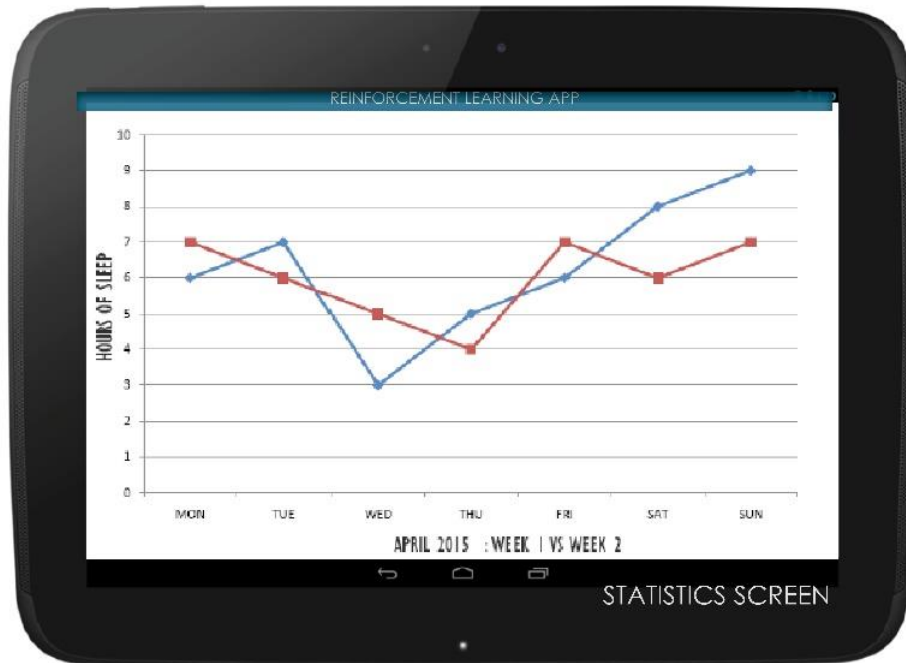
A) PRIMARY USER'S APP SCREENS





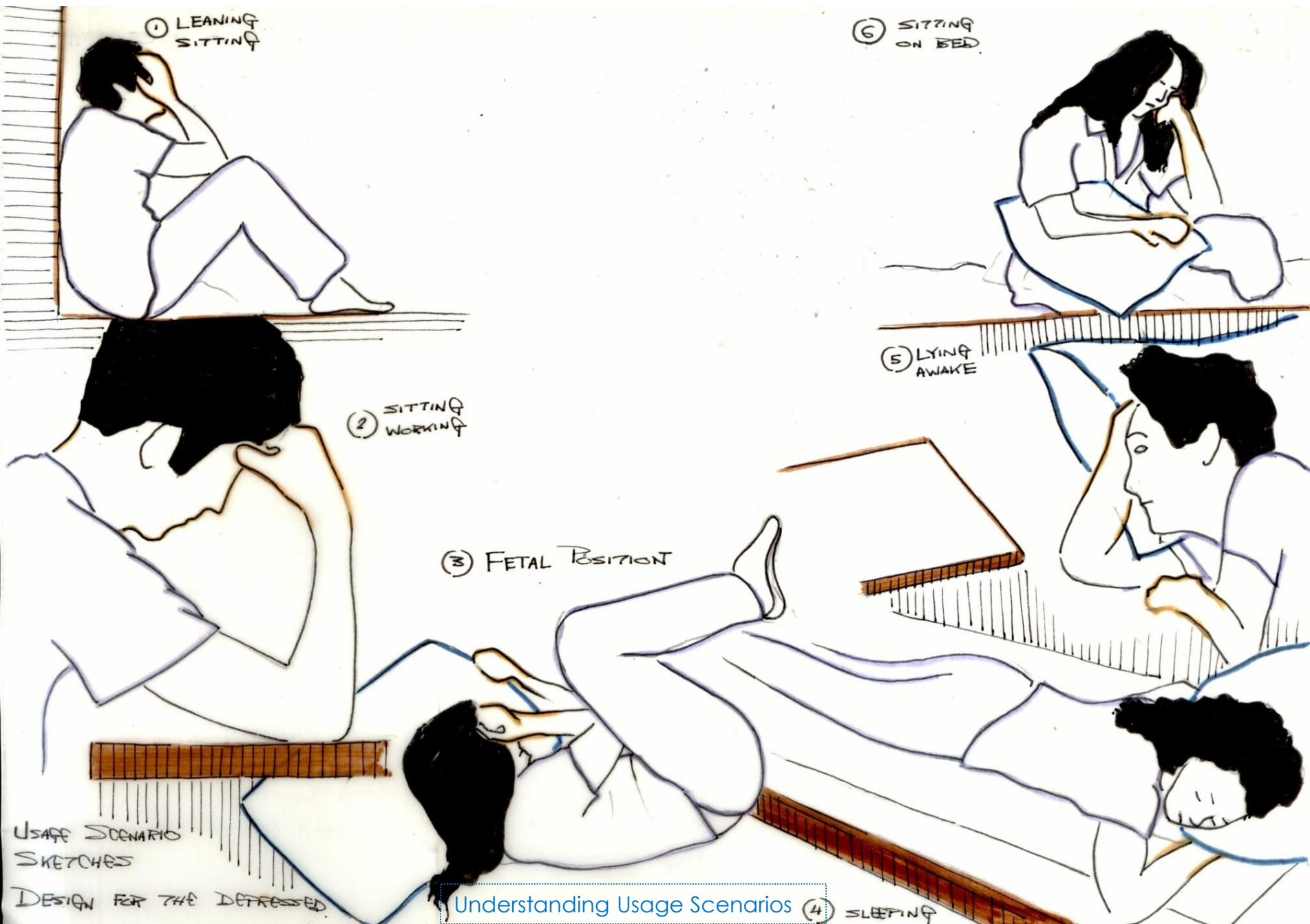
B) SUPPORT GROUP'S APP SCREEN





B) THERAPIST'S APP SCREENS

EXPLORATION OF POSSIBLE PRODUCT CONFIGURATIONS TO ACCOMMODATE MULTI-SENSORY REWARD SYSTEM



C1 DOCKED TACTILE ELEMENT

PLAYFUL TOYS FOR ADULTS
EXPRESSIVE FUN CHARACTERS
TACTILE LIGHT & SOUND
GUITAR HERO
BOBBLE HEAD TYPE
PLAYFUL FORMS
CONSTRUCTIVE GAME PLAY
NOSTALGIC ELEMENTS

C2 HEAD-MOUNTED TYPE

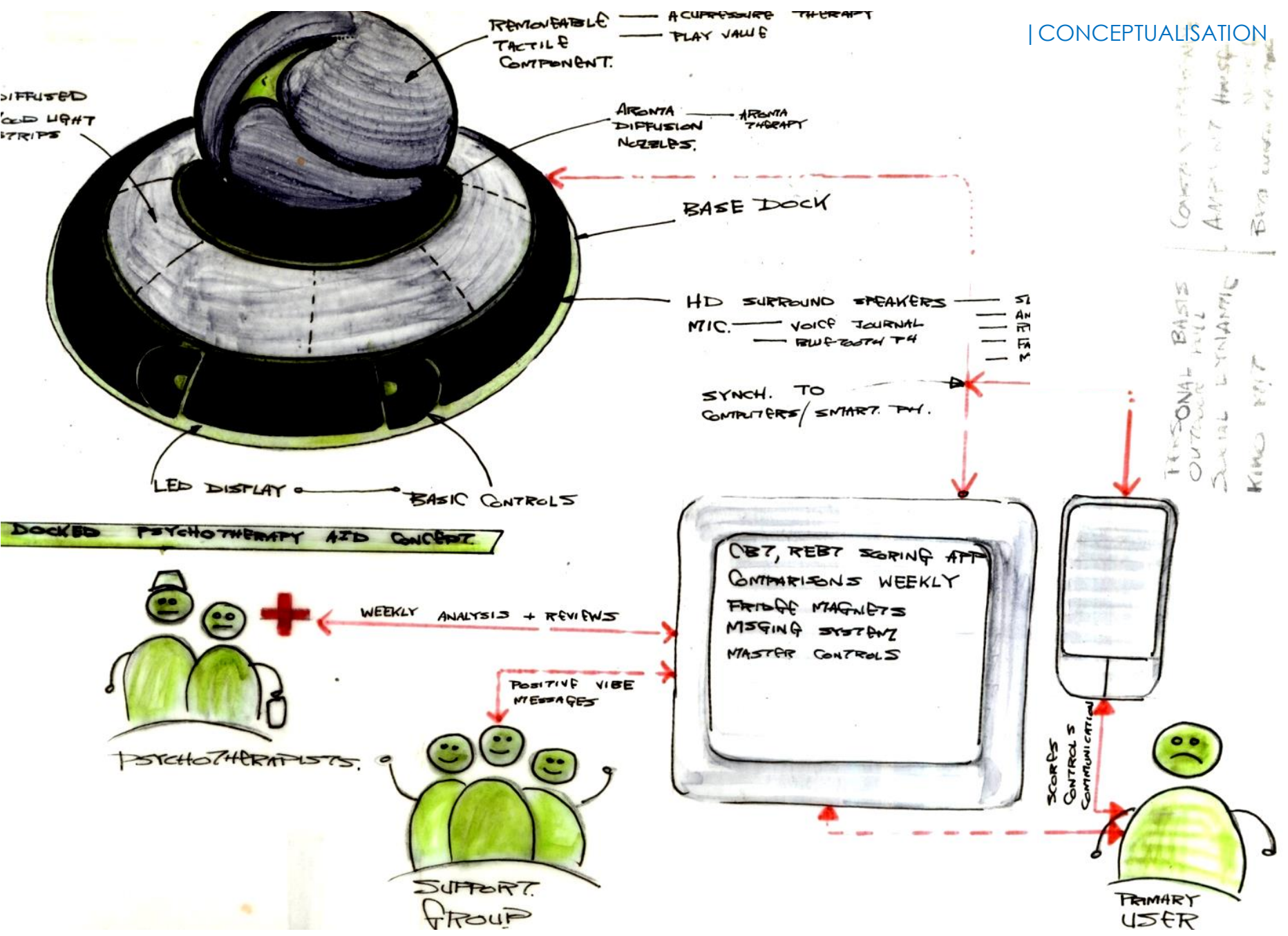
ROBOCOP HEAD-MOUNT
MASSAGE HELMET TYPE
ORGANIC PATCH
3 CIRCLE CLUSTER TYPE
HEALING PILLOW TYPE
HUGGABLE PILLOW TYPE
TRAVEL PILLOW TYPE
RETRO AVIATOR SHADE VARIANT

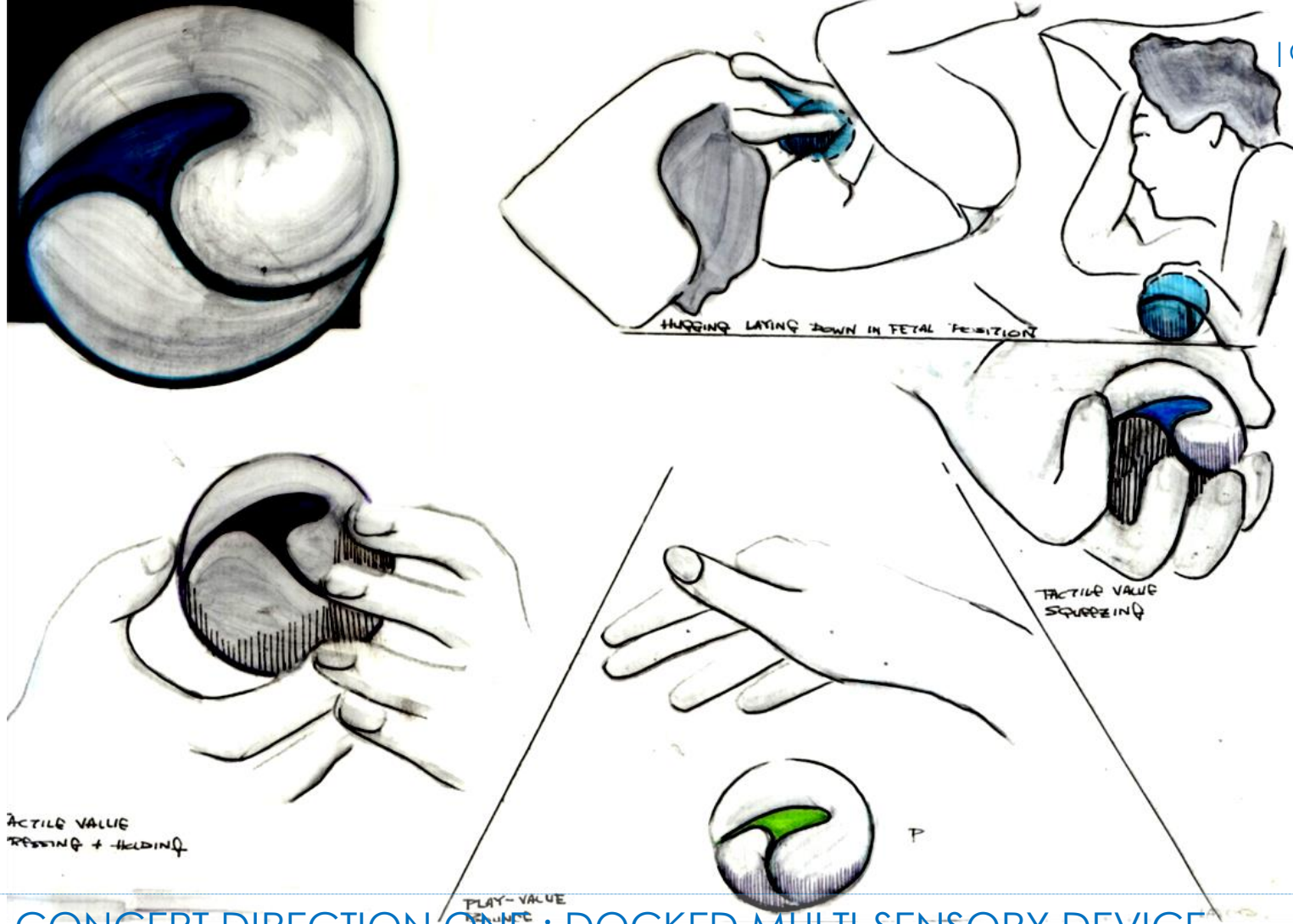
PSYCHOLOGY BASED

CBT & REBT INSIGHTS
ACCUPRESSURE THERAPY
MUSIC THERAPY
AROMA THERAPY
LIGHT THERAPY
SLEEP WAVES
AMBIENT HOME SOUNDS
REINFORCEMENT LEARNING
PETS AND COMPANIONS
NATURAL ENVIRONMENT
ALWAYS WIN GAMES
DAILY AUDIO DIARIES
POSITIVE AFFIRMATIONS

C3 SAFE SPACE SCREEN

SLEEPING / RELAXING POD CONFIG.
HAMMOCK TYPE
PERSONAL WORKSPACE TYPE
WORKSPACE SEPARATION SCREENS
EXPERIENCE DESIGN TYPE





CONCEPT DIRECTION ONE : DOCKED MULTI-SENSORY DEVICE

PROS

1. Tactile Play Value
2. Stress Relief ball
3. Well disguised
4. Multiple usage scenarios.

CONS

1. Complex product packaging and integration is required to house all reward sub-systems.
2. Hygiene issues arising from incorrect usage of product.

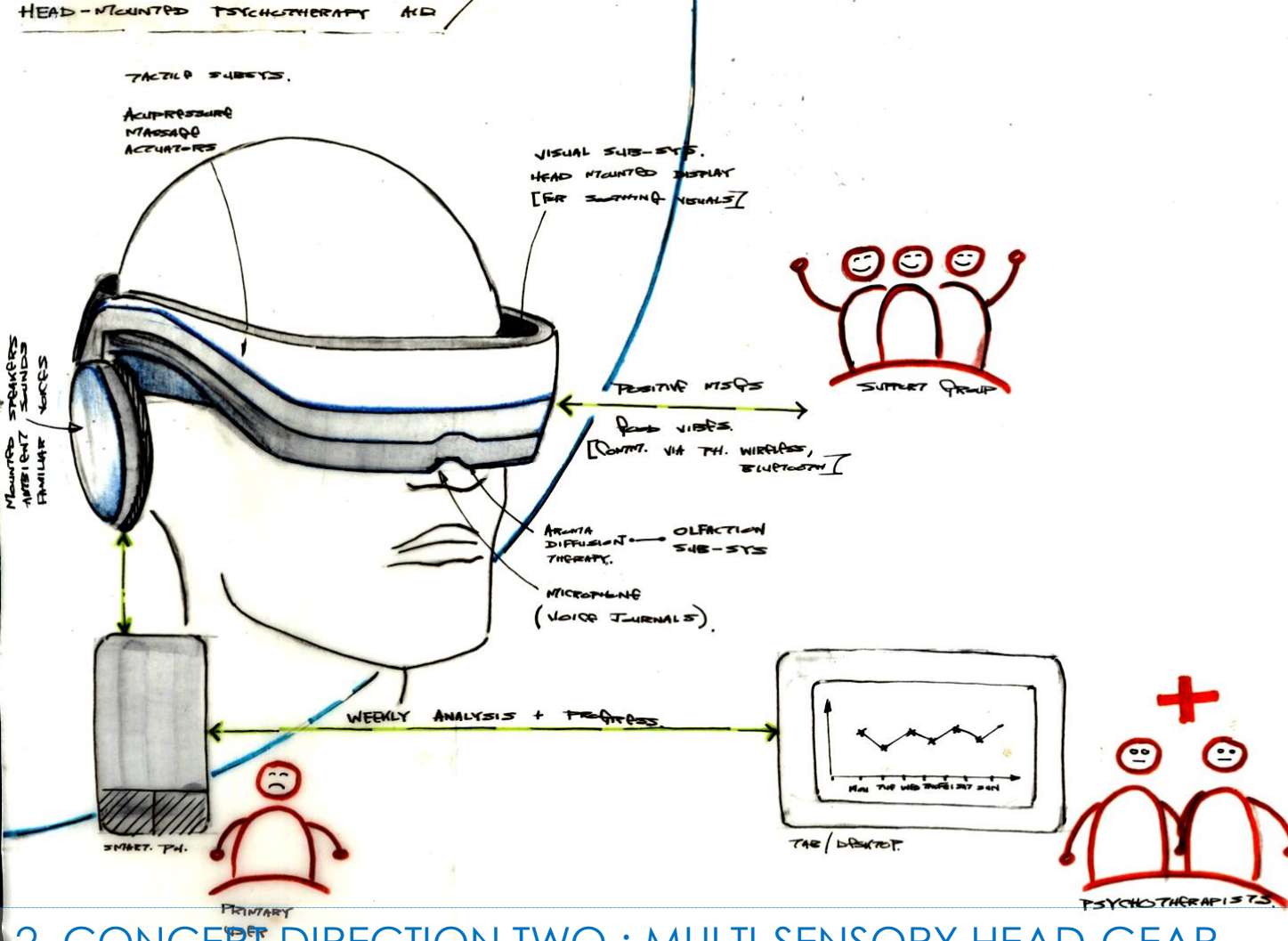
USAGE SCENARIOS

Docked :

Hostel , Home (Indoors)

Undocked:

Inside bag, can carry it to college etc.

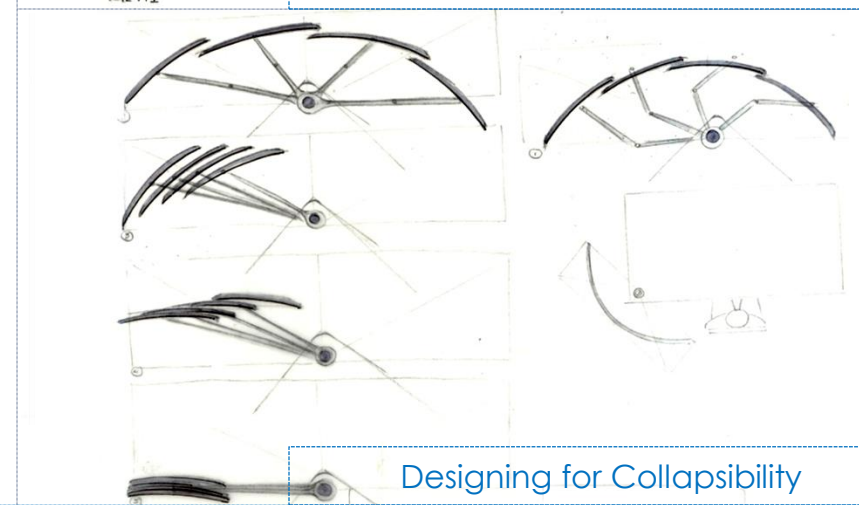
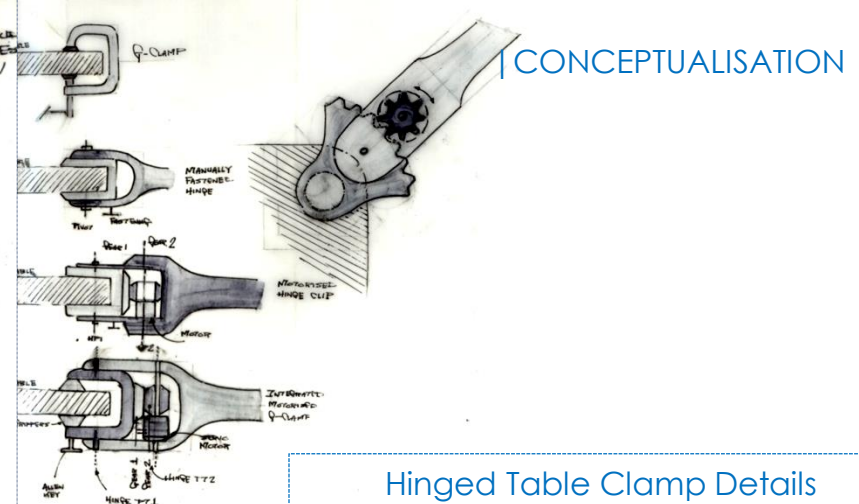
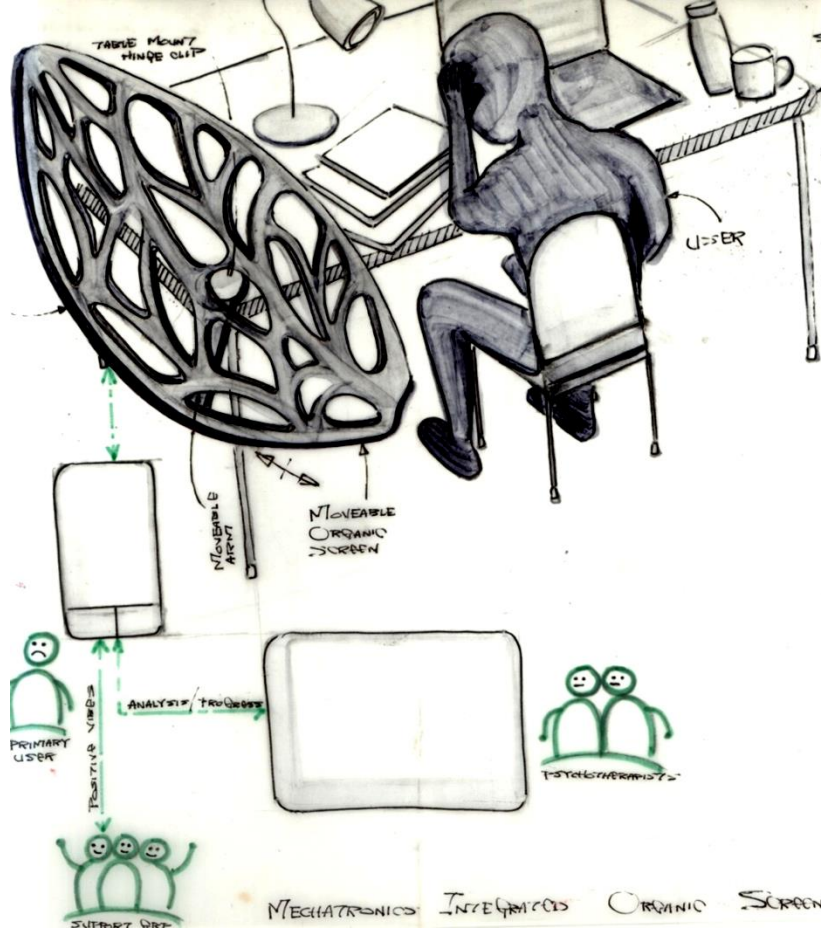


2. CONCEPT DIRECTION TWO : MULTI-SENSORY HEAD-GEAR

PROS	CONS
1. Close Sensory Association	1. Not as portable
2. Temporal Massage	2. Perspiration & stuffiness
3. Use can be extended	3. When not worn on the head, no particular use
4. More Volume for to Integrate reward sub-systems	4. Constrains posture required to lie down.
5. Funky, Hi-Tech Aesthetics	

USAGE SCENARIOS

Home (Indoors)
Hostel (Indoors)
College (Indoors)



3. CONCEPT DIRECTION THREE : MULTI-SENSORY SAFE SPACE SCREEN

PROS

1. Directly affects the environment in the user's room.
2. Helpful when user want to get away , provides privacy.

CONS

1. Empowers withdrawal as an escape strategy.
2. Manufacturing complexity of form.
3. Very bulky for cramped hostel rooms.

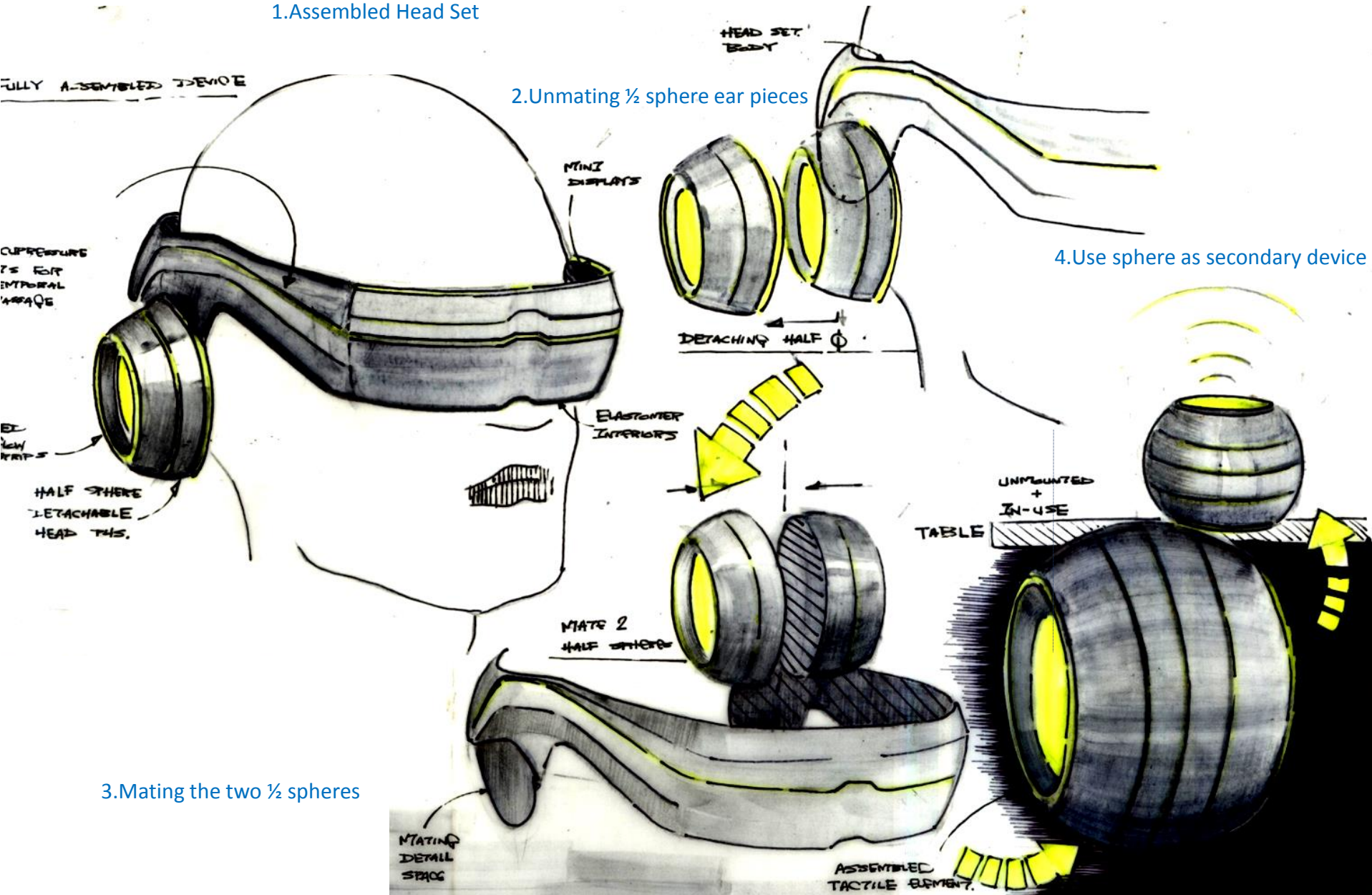
USAGE SCENARIOS

1. Home (Indoors)
2. Hostel (Indoors)

1.Assembled Head Set

2.Unmating ½ sphere ear pieces

4.Use sphere as secondary device



3.Mating the two ½ spheres

UNDERSTANDING THE TARGETTED USER GROUPS PERCEPTION OF PRODUCT FORM LANGUAGE

OVERVIEW OF STUDY

■ **TARGETED USER GROUP :**
15 UNIVERSITY STUDENTS (18 – 25 YRS)

■ **TARGETED KEYWORDS :**
1. MULTI-SENSORY HEAD GEAR
2. SPHERICAL WIRELESS SPEAKERS

■ **METHODS:**
SEMANTIC GRADIENT
CARD SORTING
INTERVIEWS

■ **TEST TIME:** **20 MIN /USER**

■ **EXPRESSIONS:**

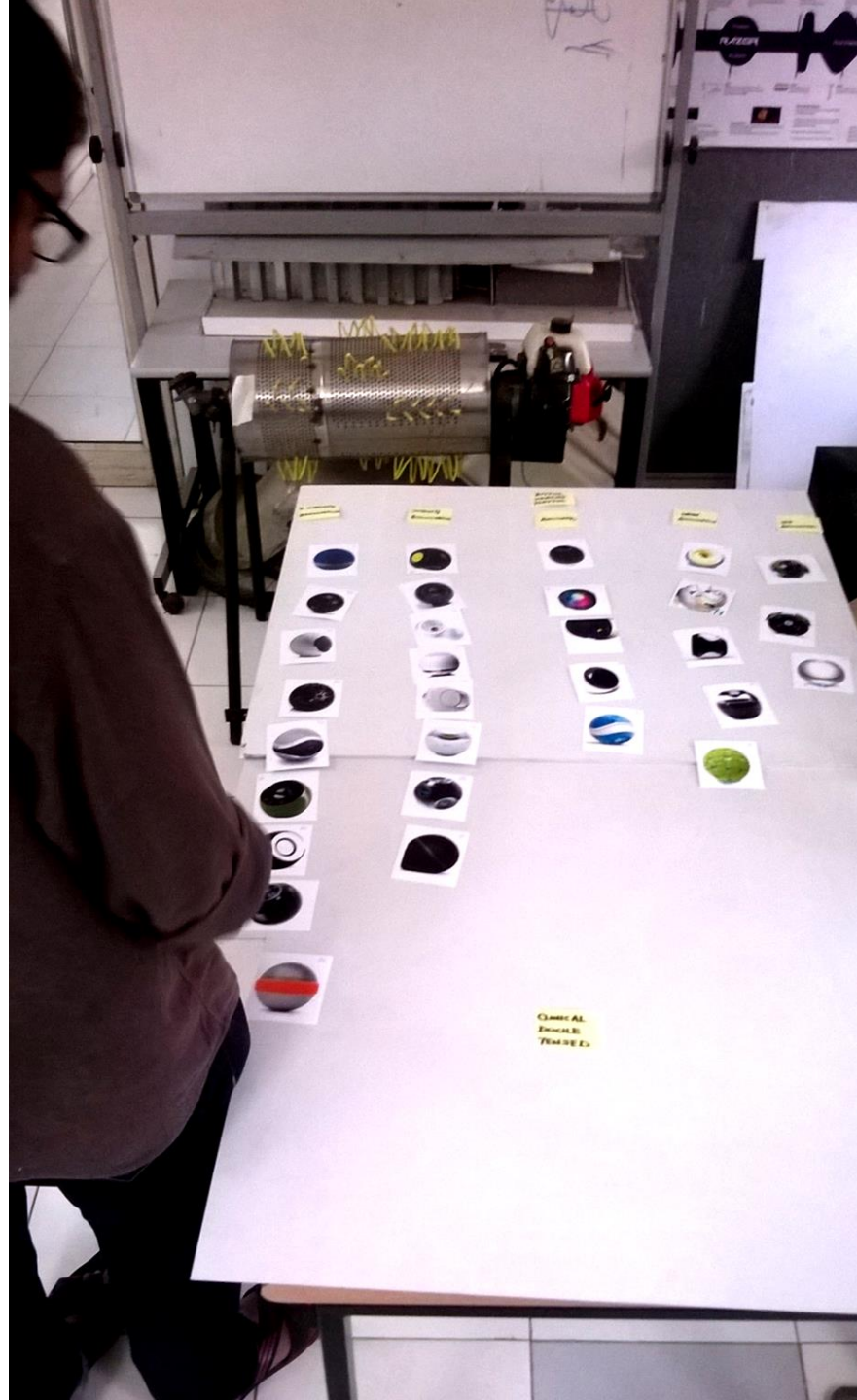
SET1 : JOYFUL, PROACTIVE, SERENE

SET2 : CLINICAL , PASSIVE , STRESSFUL









SEMANTICS OF SPHERICAL WIRELESS SPEAKERS



FEATURES

- Nose grooves , eye contours ,head fastening straps ,ear elements.
- visible control elements like buttons and dials.

- Representation of spectacle frame form.
(B shape)
- Looks like its packed with features for each sense.
- Dynamic ,agile form language.

EXPRESSIONS

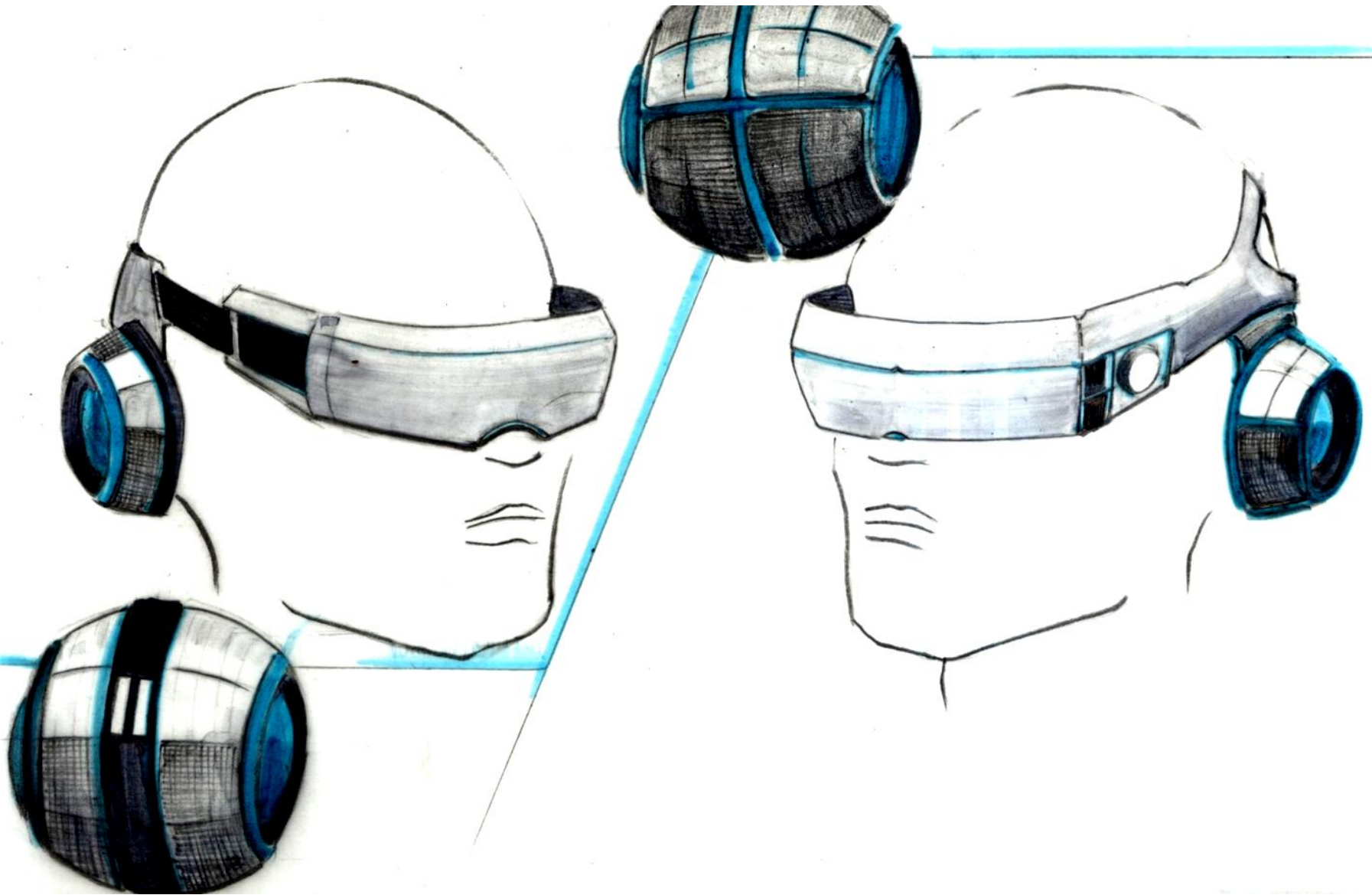
- Bright ,warm colours
- Multiple textures
- Form styling is more towards cool , funky and casual.
- Chunky , toy-like forms

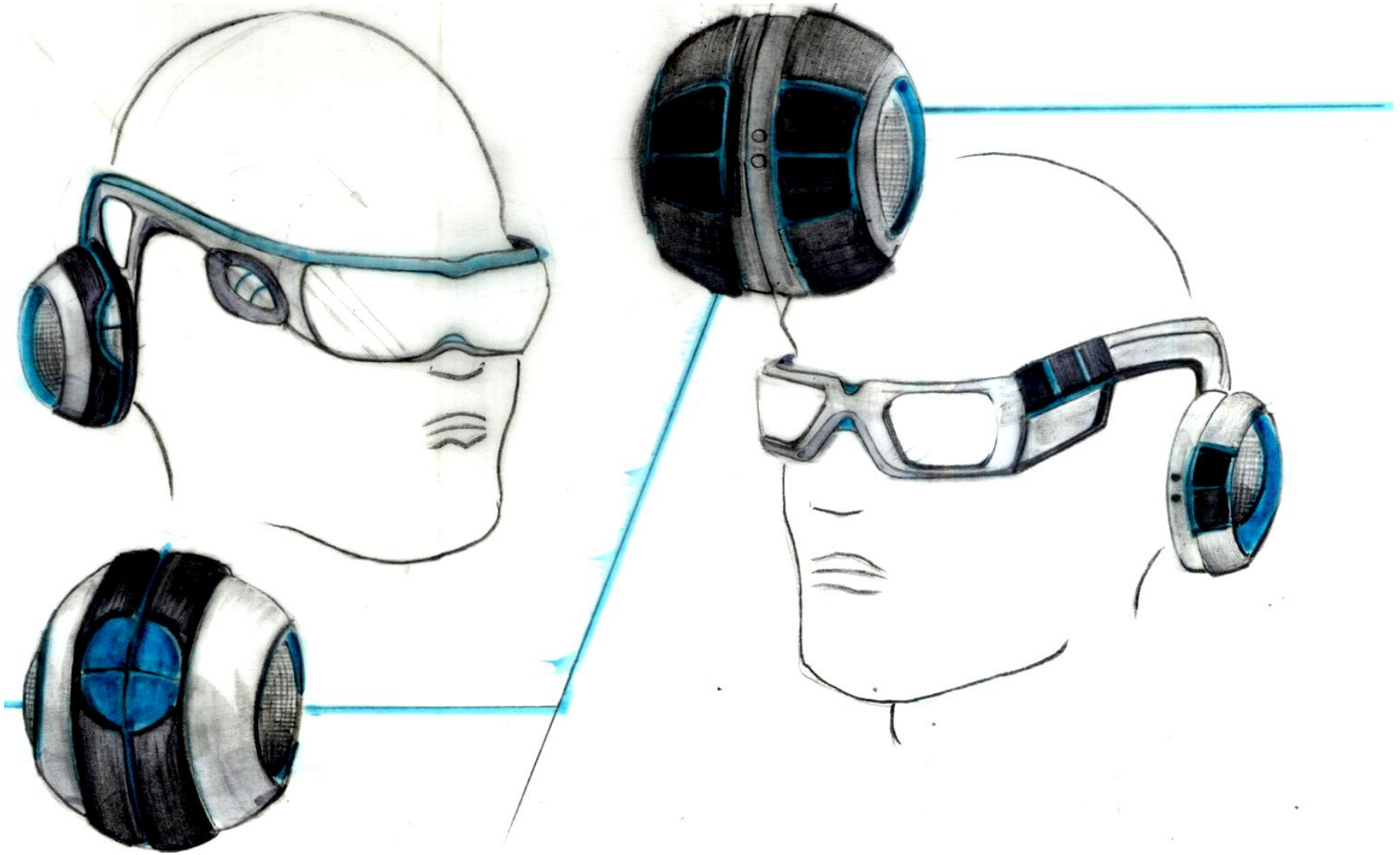
- Product expression is towards personal use , casual ,friendly and unintimidating.
- Curvilinear form contours express warmth ,approachability.
- Form elements that indicate the product is comfortable to use.

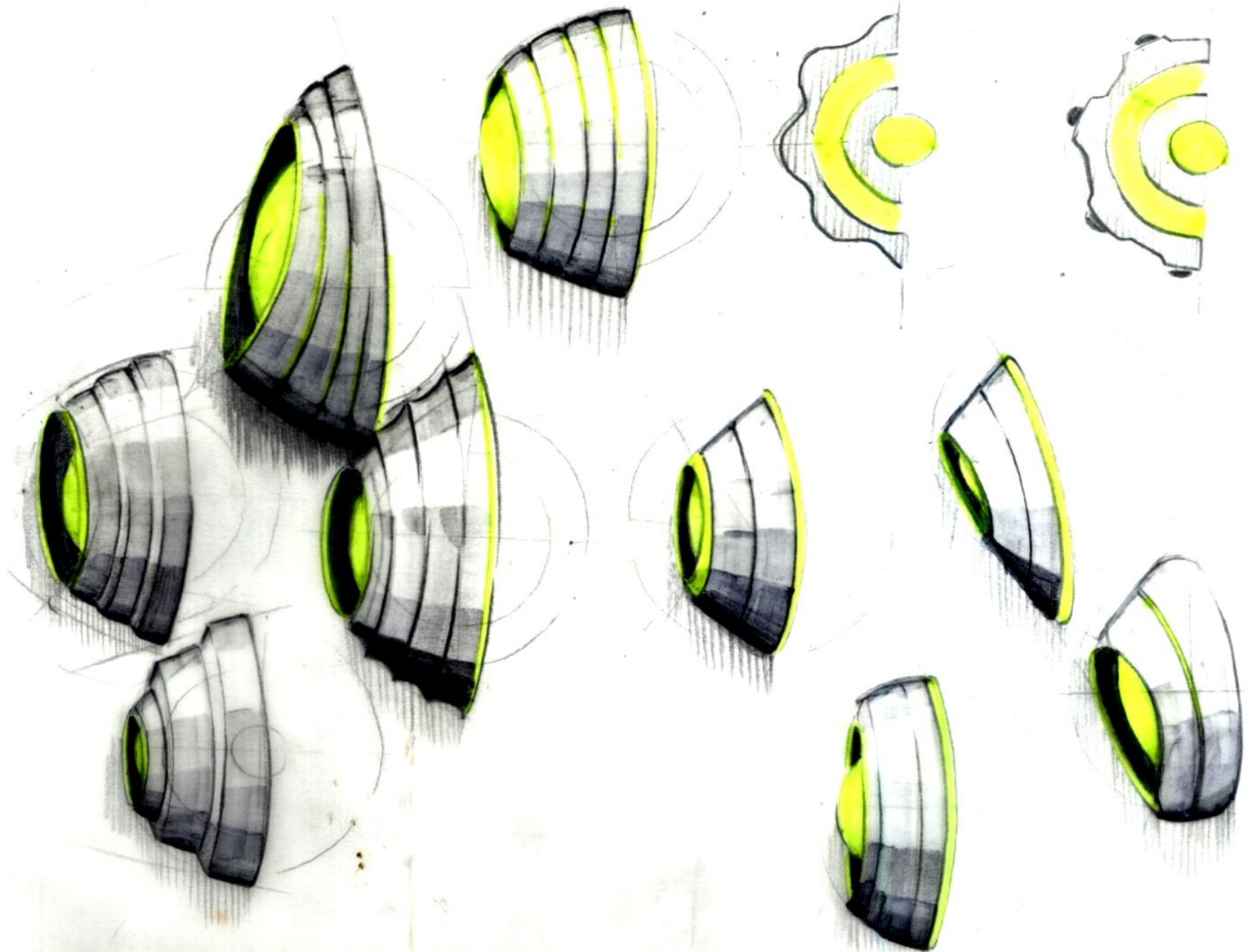
MOOD BOARD : JOYFUL, PROACTIVE , SERENE

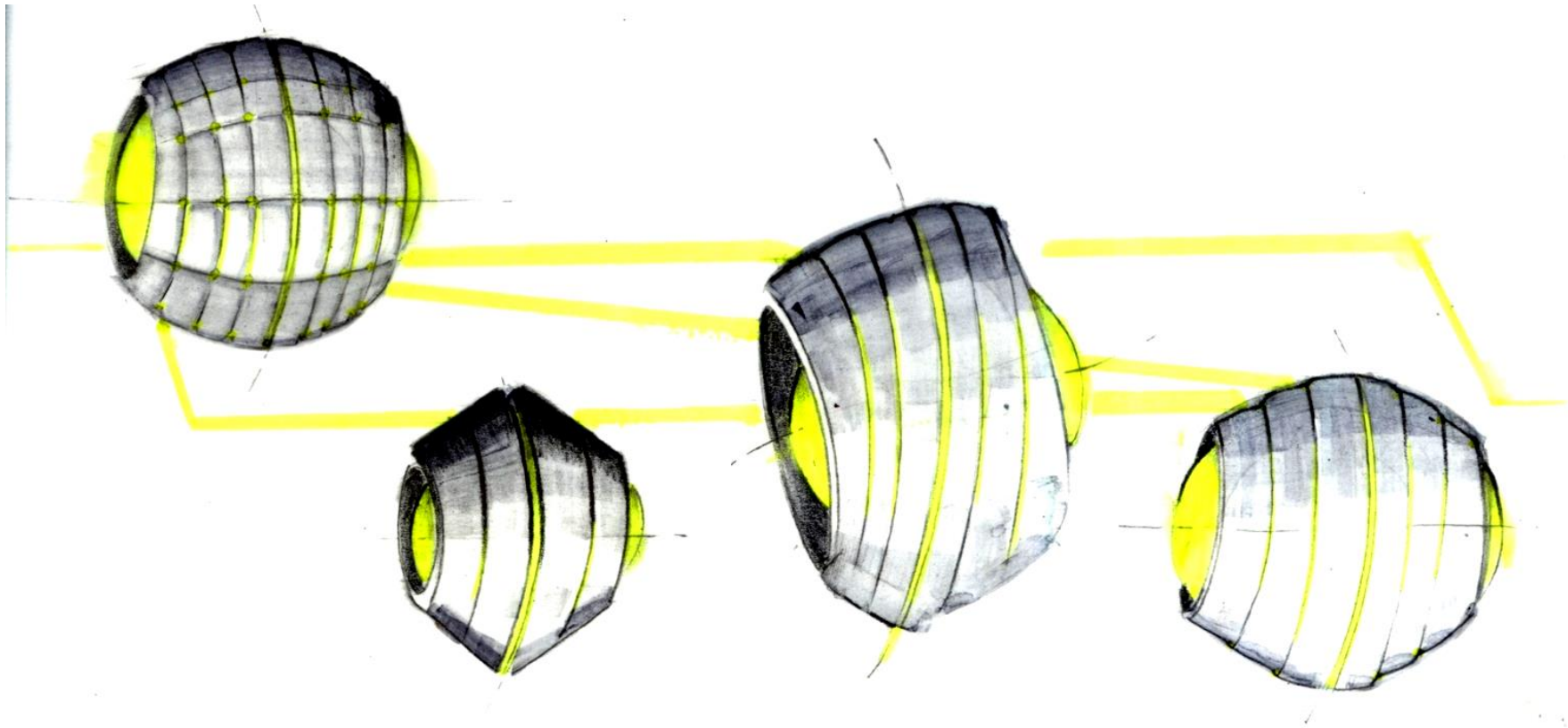


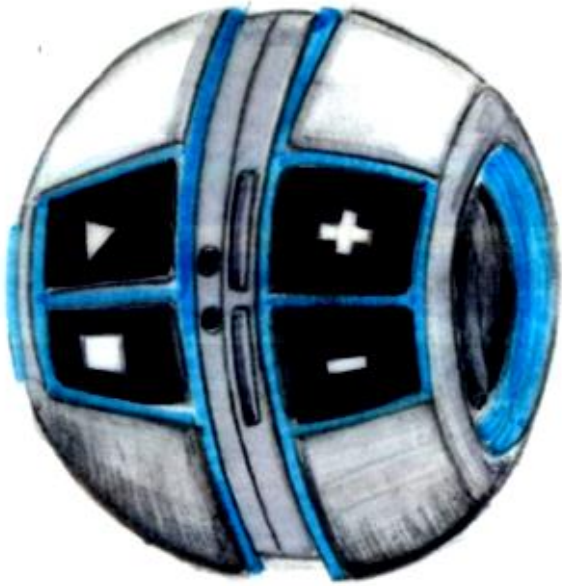






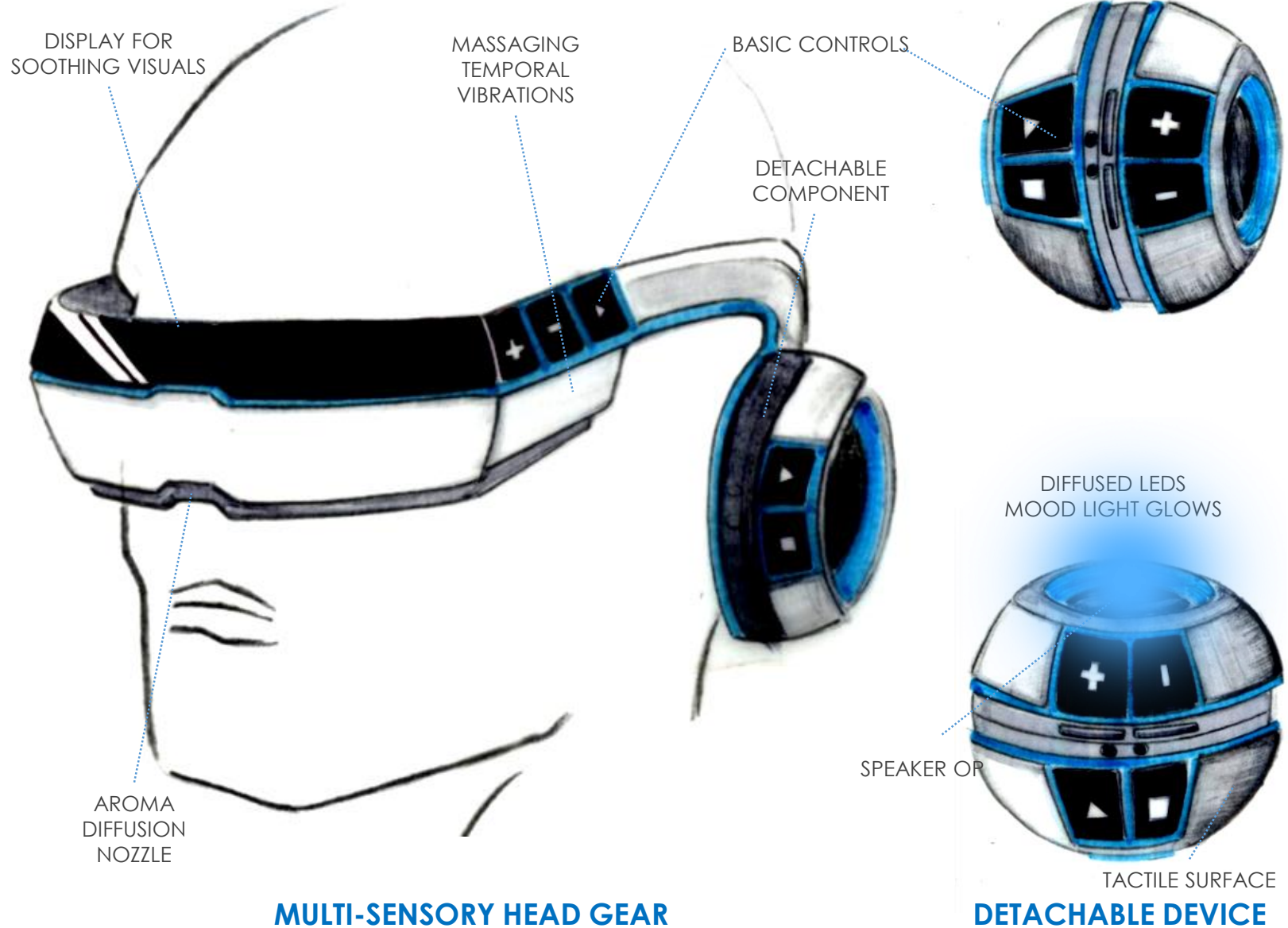






DEFINING PRODUCT USABILITY ,FEATURES AND USAGE SCENARIOS

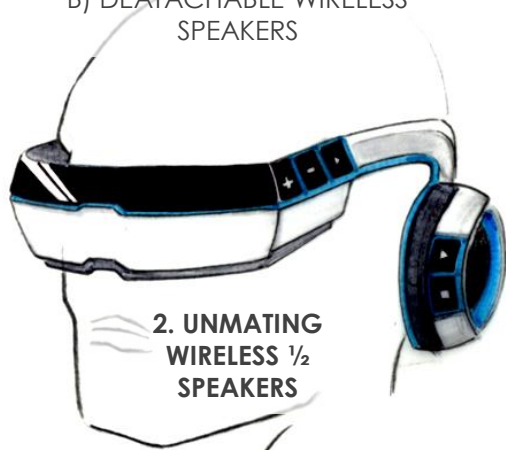
1. PART NOMENCLATURE



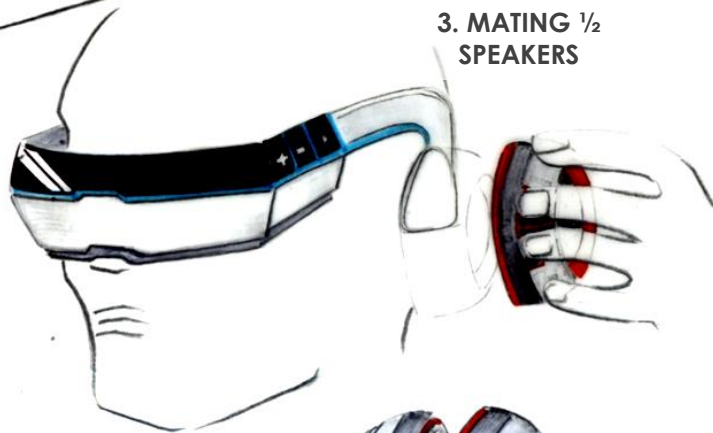
2. ASSEMBLY / DISASSEMBLY INSTRUCTIONS

1. FULLY MATED VIEW :

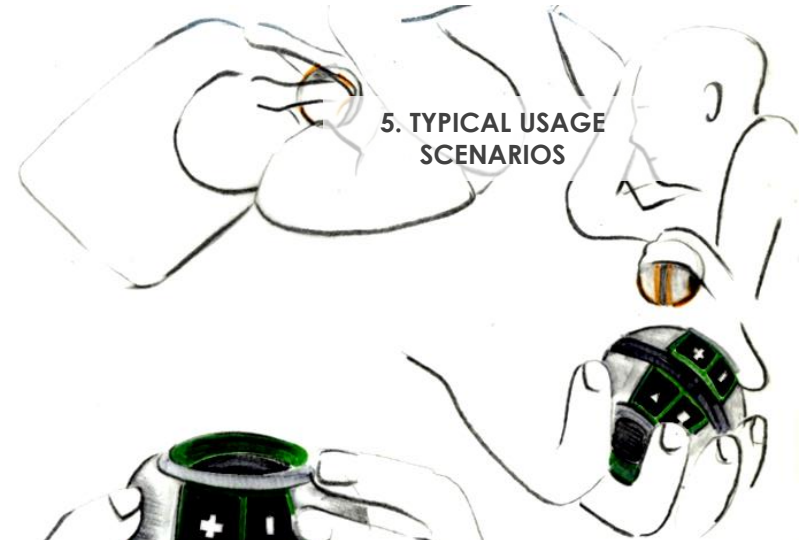
- A) MULTI-SENSORY HEADSET
- B) DEATCHABLE WIRELESS SPEAKERS



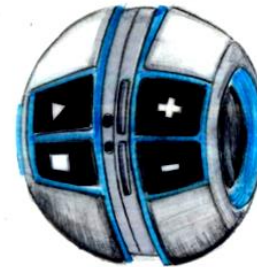
2. UNMATING WIRELESS $\frac{1}{2}$ SPEAKERS



3. MATING $\frac{1}{2}$ SPEAKERS



5. TYPICAL USAGE SCENARIOS



4. MATED WIRELESS SPEAKERS

3. USAGE SCENARIOS

A) HUGGING AND SLEEPING
IN FETAL POSITION



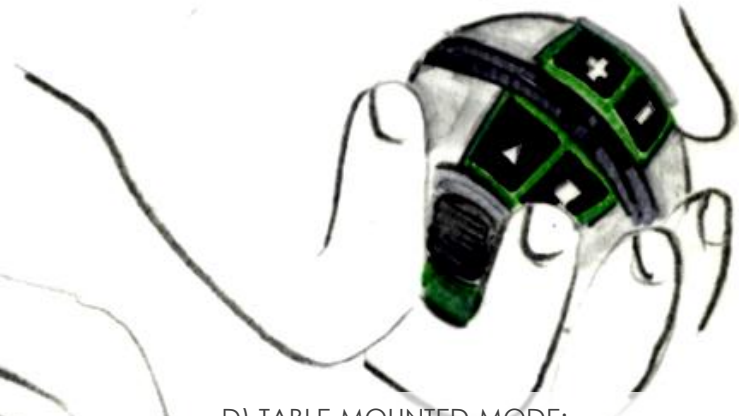
B) LYING DOWN HOLDING
THE DEVICE



C) HOLDING /SQUEEZING LIKE A STRESS BALL



D) TABLE-MOUNTED MODE:
SPEAKERS + MOOD LIGHTING



SL.		LENGTH (MM)	WIDTH (MM)	HEIGHT (MM)	REQD VOLUME (MM3)
A.	VISUAL SUBSYSTEM				104100.00
1	2 LED STRIPS	230	5	1	2300.00
2	FUZZY LOGIC IC CKT -PROCESS CONTROL -LDR	30	2	30	1800.00
3	2 O-LCD DISPLAYS	50	50	20	100000.00
B.	AUDITORY SUBSYSTEM				57600.00
1	GALVANIC RESISTANCE SENSORS- MOOD SENSING CKT	30	2	30	1800.00
2	2 BIDIRECTIONAL STEREO SPEAKERS	30	30	30	54000.00
3	FUZZY LOGIC IC CKT -PROCESS CONTROL	30	2	30	1800.00
C.	TACTILE SUBSYSTEM				34800.00
1	2 MASSAGE HEADS ROTARY	30	30	5	9000.00
2	FUZZY LOGIC IC CKT -PROCESS CONTROL	30	2	30	1800.00
3	2 SERVO MOTORS	30	20	20	24000.00
D.	OLFACTION SUBSYSTEM				45550.00
1	AROMA DIFFUSION ACTUATOR	50	35	25	43750.00
2	FUZZY LOGIC IC CKT -PROCESS CONTROL	30	2	30	1800.00
E.	PRODUCT INTERFACE DESIGN				11600.00
1	8 CONTROL + BUTTONS	20	20	2	8000.00
2	MASTER SYSTEM IC + FUZZY LOGIC FXNS	30	2	30	1800.00
3	SYNCH CKTS TO SMART PHONES	30	2	30	1800.00
F.	OTHER HARDWARE COMPONENTS				28440.00
1	CHARGING CKTS	30	2	30	1800.00
2	OP JACKS & CONNECTORS	8	4	20	640.00
3	MEMORY CARDS	20	20	5	2000.00
4	RECHARGEABLE BATTERIES	60	40	10	24000.00
TOTAL VOLUME OF COMPONENTS					282090.00
I	HEAD SET MODE				331250.00
a)	FRONT END	190	25	50	237500.00
b)	2 SIDE STEMS	75	25	50	93750.00
II	SPHERE MODE	R = 35			181218.33
TOTAL SHELL VOLUME					512468.33
EXPECTED DIMENSIONS & COSTING / PIECE					512470 CUBIC MM

