

Product Design II

“Wisp”

A complete ambience experience

Light, colour, ascent, sound and acoustic

Guide: Prof. Purba Joshi

Kshetrimayum Dhanraj Singh
22m2233

Approval

Industrial Project II

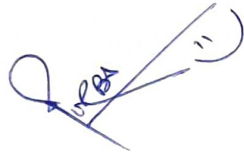
Wisp: A complete ambience experience

Submitted by

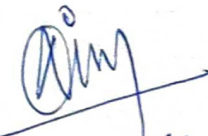
Kshetrimayum Dhanraj Singh
M.Des Industrial Design 2023-2024
22M2233

is approved as a partial fulfilment of post graduate degree in
Industrial Design.

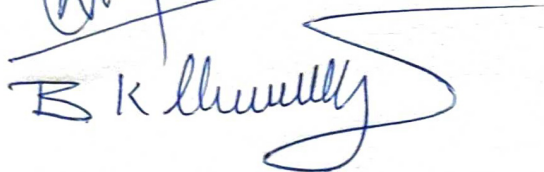
Professor Purba Joshi :
(Project Guide) ...



External Examiner :



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Declaration

I declare that the content produced in this project report is an original piece of work. Adequate citations and references have been included along with the original sources wherever applicable.

I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea / data / fact / source in my submission.

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Design Investigation

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1.1 Introduction

What is an Ambience?

Ambience refers to the atmosphere, mood, or environment that surrounds and pervades a particular place, setting, or situation. It encompasses the sensory qualities of a location or experience, including the sounds, scent, lighting, decor, temperature, and other factors that contribute to the overall feeling or character of a space.

Ambience can be used to describe the overall impression or vibe of a place, such as a cozy and inviting ambience in a café with soft music and warm lighting, or a serene and peaceful ambience in a tranquil garden. It can also refer to the background sounds or noises in a specific setting, like the ambient sounds of a forest, the hum of a city street, or the quiet of a library.

In various contexts, the term “ambience” is often used to discuss the sensory elements that create a specific mood or feeling, whether it’s in a physical location, a piece of music, a film, or a work of literature. It plays a crucial role in setting the tone and influencing the overall experience in different situations.

1.2 Elements of an ambience environment

Major elements of an ambience Environment :

Lighting & Colour

Lighting is a fundamental element in setting the mood of a space. The intensity, color, and direction of light can create a warm and inviting ambience or a cool and clinical one. Natural light, artificial lighting fixtures, and the use of shadows all play a role in defining the atmosphere. Bright and bold colors may create a lively and energetic atmosphere, while softer and neutral colors can produce a calm and soothing environment.

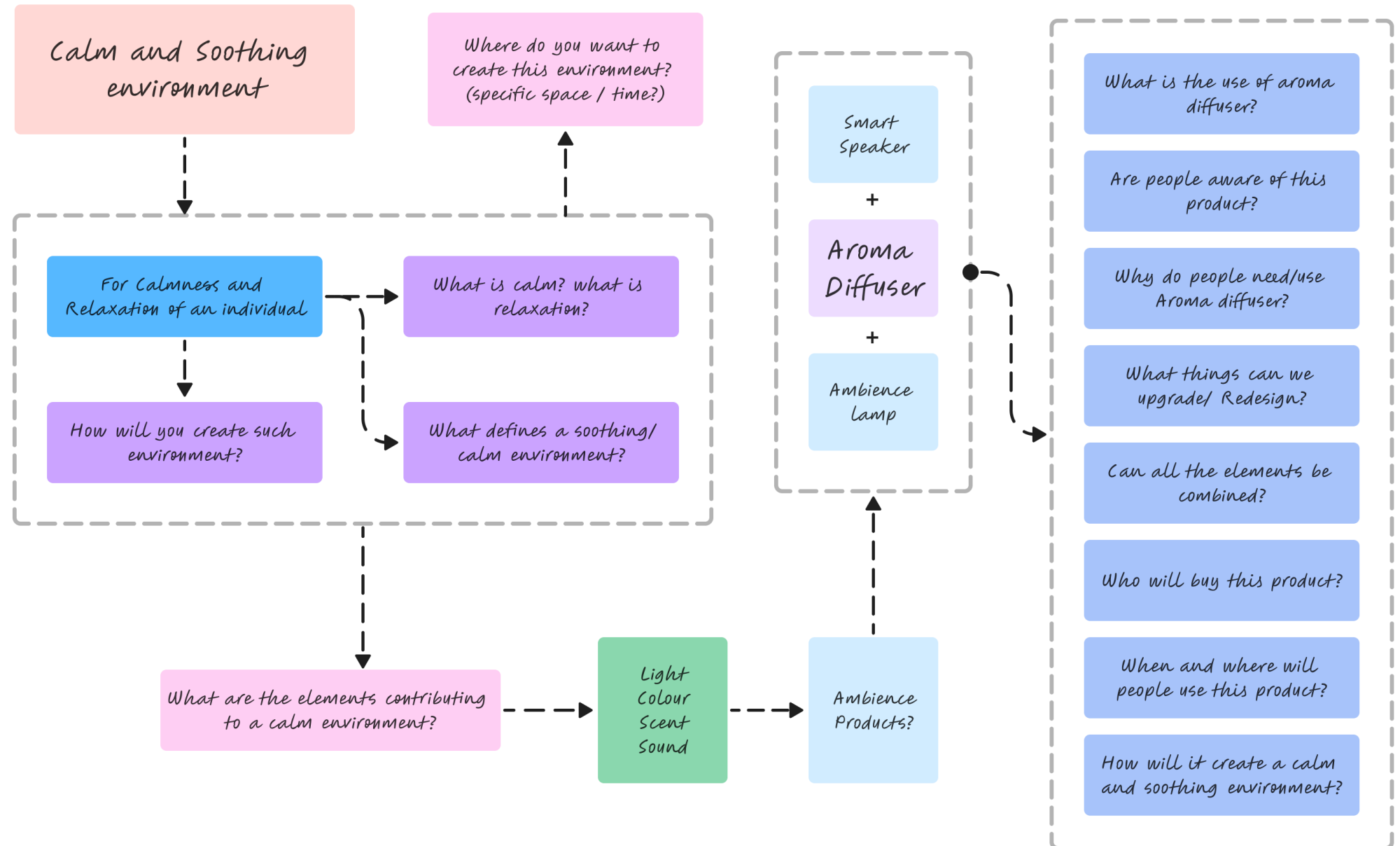
Scent

Fragrances and odors can have a significant impact on ambience. Pleasant scents, such as those from flowers, essential oils, or freshly baked goods, can enhance a positive atmosphere. Unpleasant odors, on the other hand, can be distracting and create a negative ambience.

Sound & Acoustics

The ambient sounds in a space, including background music, the hum of conversation, or the absence of noise, influence the mood. The acoustics of a space can also affect how sounds are perceived, making it feel either lively or hushed.

1.3 Product Identification & proposition



1.4 Design brief & Objectives

To redesign an Evaporative Aroma Diffuser, by incorporating other elements such as Light, Sound, Scent and colour to provide a calm and soothing experience to the user, with a focus on enhancing its overall form, functionality, safety, and additional features.

Design objectives:

Product Interface

- Create an intuitive and user-friendly interface for easy operation.
- Incorporate a smart interactive screen for displaying relevant information and control options.
- Enable customization of settings, scheduling, and remote control via mobile device.

Sound and light

- To provide soothing natural sounds with customizable features.
- Incorporate a smart lighting system with customizable intensity and colour.

Safety and Maintenance

- To provide safety mechanisms to prevent overheating and electrical hazards.
- Include automatic shut-off functions for user safety.
- To design components for easy disassembly and cleaning.

Part 2

Area of research

Chapter 2

Therapy, Light & Colour theory

- 2.1. Aromatherapy & White noise therapy
- 2.2 Colour theory in the field of Design
- 2.3 Circadian Rhythms and Lighting
- 2.4 Mood lighting

Product & User study

- 2.5 Types of aroma diffuser
- 2.6 Ultrasonic Aroma/Essential oil Diffuser
- 2.7 Existing Technology & components
- 2.8 Defining user groups
- 2.9 User interview & Demographics

2.1 Aromatherapy & White noise therapy

Aromatherapy

“Aromatherapy involves the deliberate use of aromatic compounds, typically essential oils, to enhance well-being. This therapeutic approach harnesses the olfactory system to influence mood, cognitive function, and overall health. Aromatherapy is administered through various methods such as diffusers, inhalation, or topical applications, allowing the dispersion of fragrance into the air. The practice is known for its potential to alleviate stress, improve sleep quality, and promote relaxation. Widely utilized in healthcare and wellness settings, aromatherapy is gaining recognition as a complementary therapy to address a range of physical and psychological concerns.”

White noise therapy

“White noise therapy involves the deliberate utilization of white noise, characterized by a consistent blend of all audible frequencies at equal intensity. This steady, neutral sound, akin to a continuous ‘shushing’ or static, serves to create a background ambiance. The primary objective of white noise therapy is to establish a constant and unobtrusive auditory environment, capable of masking or mitigating the impact of disruptive external sounds. Widely employed to induce relaxation, improve sleep quality, and enhance concentration, this therapeutic approach is typically administered through specialized devices such as white noise machines or dedicated applications. Its application holds promise for individuals grappling with sleep disturbances, stress, or challenges in sustaining focus.”

2.2 Colour theory in the field of Design

Importance of Colour theory in Industrial Design

Color theory encompasses the principles guiding the application of color in art and design, delving into the interplay between colors and their psychological impact. In the realm of industrial design, understanding color theory is paramount. It plays a pivotal role in shaping the visual and functional aspects of products, impacting user experience. Strategic use of color not only triggers specific emotional responses but also contributes to brand recognition and elevates the overall visual allure of a product.

Understanding and applying color theory in industrial design not only enhances the visual aspects of products but also plays a crucial role in creating meaningful, user-centric designs with a lasting impact for the user.

1. Aesthetic Enhancement

Color theory enables industrial designers to create visually appealing products by understanding how different colors work together harmoniously

2. Brand Identity

The strategic use of colors contributes to brand recognition, allowing products to be easily associated with a particular brand or company.

3. Emotional response

Colors evoke specific emotions and moods. Industrial designers leverage color theory to create products that resonate with users on an emotional level, enhancing the overall user experience.

4. Communication of Functionality

Colors can be used to communicate the functionality or purpose of a product. For example, industrial designers may use specific colors to highlight buttons or features that perform distinct functions.

5. Visual Hierarchy

By manipulating color, designers can establish a visual hierarchy, directing users' attention to specific elements or information on a product.

6. Innovation and Creativity

Exploring color theory allows industrial designers to push the boundaries of creativity and innovation, leading to unique and standout product designs.

7. Accessibility and Usability

Considering color contrast and legibility is essential for creating products that are accessible to individuals with visual impairments, ensuring inclusivity in design.

8. Market Differentiation

In a competitive market, color can be a powerful tool for setting products apart from competitors, helping them stand out on store shelves or in online environments.

9. Psychological Impact on Purchase Decisions

Consumer purchasing decisions are often influenced by the visual appeal of a product. Color theory aids designers in creating products that align with target demographics and consumer preferences.

2.3 Circadian Rhythms and Lighting

Circadian Rhythms

Circadian rhythms are natural, internal processes that regulate the sleep-wake cycle and repeat roughly every 24 hours. These biological rhythms are influenced by external cues, most notably the daily light-dark cycle. The circadian system plays a crucial role in regulating various physiological and behavioral functions, including sleep, hormone production, body temperature, and alertness.

Lighting and Circadian Rhythms

Lighting, especially exposure to natural light, is a primary external cue that influences circadian rhythms. The intensity, color temperature, and timing of light exposure can have profound effects on the body's internal clock. Key points include:

1. Light Intensity

Bright light exposure, particularly in the morning, helps regulate the circadian clock, promoting alertness and regulating the sleep-wake cycle. Dimming lights in the evening signals the body to prepare for sleep by mimicking natural light changes.

- Morning Wake-Up

- Higher light intensity in the morning helps regulate the circadian clock, signaling to the body that it is time to wake up and be alert.

- Midday Productivity

- Bright, intense lighting during midday supports increased alertness and productivity by reinforcing the body's natural response to daytime.

- Evening Relaxation

- Lower light intensity in the evening helps signal to the body that it is time to wind down and prepare for sleep by mimicking natural changes in outdoor lighting.

- Nighttime Dimming

- Dimming the lights at night promotes the production of melatonin, a hormone that regulates sleep, aiding in the preparation for a restful night.

- Shift Work Adaptation

- Adjustable light intensity in shift work environments helps individuals adapt to different work schedules and maintain a more stable circadian rhythm.

2. Colour of light

Blue-enriched light in the morning enhances alertness and suppresses melatonin production, supporting wakefulness. Warm, amber-toned light in the evening minimizes disruption to circadian rhythms, facilitating the transition to sleep.

- Morning Blue Light

- Blue-enriched light in the morning enhances alertness and cognitive function, suppressing melatonin production to support wakefulness.

- Daylight Simulation

- Natural daylight, with a balanced spectrum of colors, is ideal for maintaining circadian health by providing the appropriate cues for different times of the day.

- Warm Light in the Evening

- Warm, amber-toned light in the evening minimizes the disruptive effects on circadian rhythms, allowing for a smoother transition to sleep.

- Reduced Blue Light at Night

- Limiting exposure to blue light in the evening, such as from electronic devices, helps prevent interference with melatonin production and supports a more restful sleep.

- Adaptive Lighting Systems

- Circadian-centric lighting systems adjust color temperature throughout the day to mimic natural light changes, promoting a harmonious alignment with circadian rhythms.

2.4 Mood Lighting

Mood lighting

Mood lighting involves the intentional manipulation of light to establish a particular atmosphere or ambiance, influencing the emotional and psychological responses of individuals within a space. This type of lighting design focuses on creating specific moods or feelings by adjusting key elements such as intensity, color, and direction of light. The goal is to enhance the overall experience of a given environment by tailoring the lighting to evoke desired emotional effects.

1. Colour temperature

Warm tones, such as yellows and oranges, are often associated with coziness and relaxation, while cooler tones, like blues and purples, may convey a sense of calm or sophistication.

2. Intensity

Dimmed or soft lighting is commonly used for creating a relaxed and intimate atmosphere, while brighter lighting may be employed to energize and uplift a space.

3. Color Changing Capabilities

Some modern lighting systems allow for color changes, enabling dynamic adjustments to suit different moods or occasions.

4. Dynamic Lighting Scenes

Mood lighting can be dynamic, with the ability to transition between different lighting scenes to suit various activities or times of day.

2.5 Types of Aroma Diffusers

1



Ultrasonic
Essential oil Diffuser

2



Evaporative
Essential oil Diffusers

3



Natural wood
Essential oil Diffusers

4



Nebulizer
Essential oil Diffusers

5



Heat
Essential oil Diffusers

2.6 Ultrasonic Aroma/Essential oil Diffuser

Ultrasonic Aroma Diffuser

“The Ultrasonic Aroma Diffuser represents a modern innovation in aromatherapy, employing ultrasonic technology to diffuse aromatic compounds into the surrounding environment. This device utilizes ultrasonic vibrations to break down essential oils into tiny particles, creating a fine mist that permeates the air. The Ultrasonic Aroma Diffuser offers a gentle and effective method for harnessing the therapeutic properties of essential oils, contributing to stress reduction and the enhancement of ambient conditions. Recognized for its adaptability and user-friendly design, this technology has gained widespread acceptance, exemplifying the integration of aromatherapy into contemporary approaches to well-being.”



2.7 Existing Technology & components

Base or Main Unit

- This is the main housing that contains the essential components of the diffuser, such as the motor, ultrasonic technology (if applicable), and electronic controls.

Water Reservoir

- A chamber where water is added to the diffuser. Essential oils are often mixed with water to create a fine mist that is released into the air.

Ultrasonic Plate

- A chamber where water is added to the diffuser. Essential oils are often mixed with water to create a fine mist that is released into the air.

Misting Nozzle

- Responsible for releasing the mist into the air. The design of the nozzle can affect the dispersion pattern and coverage.

Lid or Cover

- The top part that covers the water reservoir. Some diffusers have decorative or functional lids.

Power Button/Controls

- Interface for turning the diffuser on/off and adjusting settings. In more advanced models, this may include timer settings or intensity controls.

LED Lights (optional)

- Many aroma diffusers come with built-in LED lights, adding a visual element to the aromatherapy experience. These lights may offer a variety of colors and can sometimes be adjusted or turned off.

Power Cord

- The cable that connects the diffuser to a power source. Some models may be battery-operated for increased portability.

Ventilation Holes

- Openings designed to allow the release of cool mist and prevent the device from overheating.

Rubber Feet or Pads

- These are often found on the bottom of the diffuser to provide stability and prevent slipping on surfaces.

Air Intake

- Air intake for air circulation, especially in models that use a fan for dispersing scents

Remote Control

- In more advanced models, a remote control may be included for convenient operation from a distance.



Source: andreportfolio.com

2.8 Defining User group

Target User group



Aromatherapy
Enthusiasts



Yoga and Meditation
Practitioners



Student



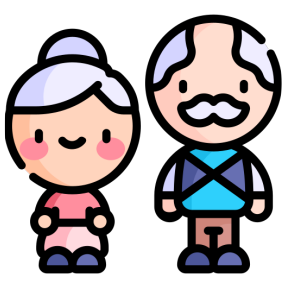
Parents & Families



Home Decor
Enthusiasts



Office worker



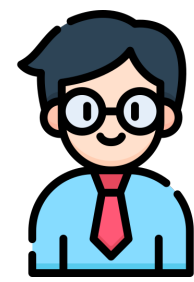
Elderly individuals



Spa & Wellness

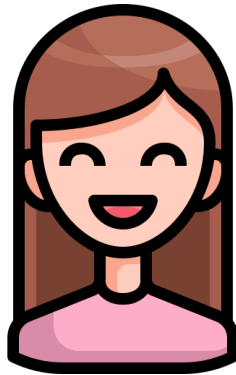


Gift Shops



Teachers &
Professors

2.9 User interview & Insights



Teressa Ngangom

Gender: Female

Age: 26

Occupation : Architect

Product Functionality

Essential function : Automatic shut off

Product size: Small, Portable

Water capacity: large

Lighting: yes

Usage Pattern

Usage: Daily

Purpose: Enhancing the ambiance of living spaces

Location : Workspace, Bedroom, office

Minimum usage duration: 1-2 hours

Safety & maintenance

Safety : Automatic shutoff

Maintenance : Easy to clean

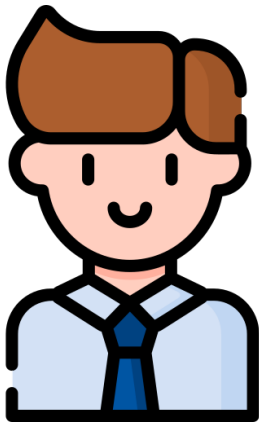
Product Material

Sustainable : Wood & bamboo

Additional features

Design preferences: Minimalistic and simple

Lighting and different colours



Aaron Chen

Gender: Male

Age: 25

Occupation : Design Student

Product Functionality

Essential function : Automatic / Manual shut off & variable mist intensity

Product size: Small, Portable

Water capacity: Medium

Lighting: Optional

Usage Pattern

Usage: Daily

Purpose: Improving air quality & Enhancing the ambiance of living spaces.

Location : Bedroom, workspace

Minimum usage duration: 1 hour

Safety & maintenance

Safety : Automatic shutoff

Maintenance : Indicator for oil/ water.

Cleaning (low priority)

Product Material

Sustainable : Bamboo

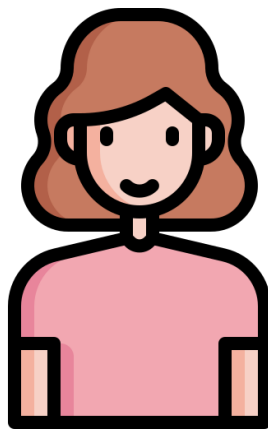
Additional features

Design preferences: Oriental, Vintage.

Automatic refill chamber (Second refill chamber) to last long and refill it automatically.

Acts like a lamp, auto lights off / Manual.

Low maintenance (good product form to have low maintenance)



Anita Naorem

Gender: Female

Age: 52

Occupation: Home decor

Product Functionality

Essential function : Automatic / Manual shut off

Product size: Small, Portable

Water capacity: large, but not too large.

Lighting: Yes, stationary lights.

Usage Pattern

Usage: Daily

Purpose: Enhancing the ambiance of living spaces & good fragrance.

Location : Living room, Bedroom, bathrooms

Minimum usage duration: 2-3 hour

Safety & maintenance

Safety : Automatic shutoff

Maintenance : Easy to clean

Product Form (Top priority)

Product Material

Any material, smooth surface,
less edges, grooves and holes.

Additional features

Design preferences: Minimalistic.

Diffuse multiple fragrance (simultaneously / mix / Separately)

Different oil slots/container for different time of the day / mood.

Placement style: wall mounted/ table top/ desktop?



Siladitya Samir

Gender: Male

Age: 26

Occupation: Design Student

Product Functionality

Essential function : Timer setting & LED lighting

Product size: Optional

Water capacity: Medium

Lighting: Yes, stationary lights.

Usage Pattern

Usage: Daily

Purpose: Aromatherapy and relaxation & Enhancing the ambiance of living spaces.

Location : Workspace, living room.

Minimum usage duration: 1-2 hour

Safety & maintenance

Safety : Automatic shutoff & Timer System

Maintenance : Easy to clean (Top priority)

Product Material

Sustainable: Clay & Ceramic

Additional features

Design preferences: Artistic, sculpture, showpiece.

Interactive / Dynamic form (changes + effects)

Form changes triggers fragrance (like button)



Naorem Bidyalaxmi

Gender: Female

Age: 28

Occupation: Bussiness women

Product Functionality

Essential function : Variable mist intensity

Product size: Small, Portable

Water capacity: Medium

Lighting: Yes, stationary lights.

Usage Pattern

Usage: Weekly

Purpose: Enhancing the ambiance of living spaces

Location : Reading room.

Minimum usage duration: 1 hour

Safety & maintenance

Safety : Automatic shutoff

Maintenance : Easy to clean (high priority)

Product Material

Sustainable: Wood & bamboo

Additional features

Design preferences: Artistic, vintage

Part 3

Design Process

Chapter 3

- 3.1 Design Introduction
- 3.2 Mood board
- 3.3 Concept sketches
- 3.4 3D form concepts
- 3.5 Final Product

3.1 Design introduction

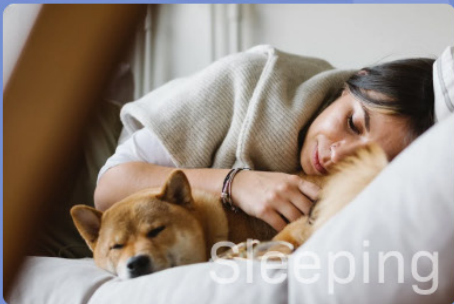
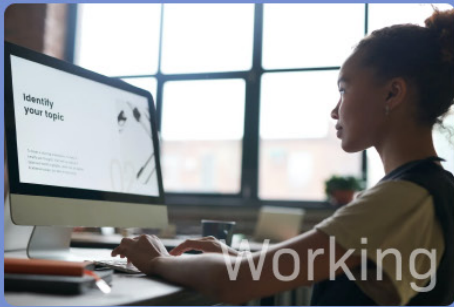
WISP

A COMPLETE AMBIENCE EXPERIENCE
Light, color, scent, sound, and acoustics

Wisp represents a unique ambience product that seamlessly blends various atmospheric elements, including light, color, scent, sound, and acoustics. It innovatively combines the functionalities of an aroma diffuser, a smart speaker, and an ambience lamp, providing a holistic and immersive sensory experience.

This is an academic project spanning four weeks, done during my third semester as an Industrial Design student at IIT Bombay, Mumbai.





THE PROJECT

started with the idea of designing an ambience product, which will help in creating different moods in different situations and environment.

Calm and Soothing environment

For Calmness and Relaxation of an individual

How will you create such environment?

What are the elements contributing to a calm environment?

*Where do you want to create this environment?
(specific space / time?)*

*What is calm?
what is relaxation?*

*What defines a soothing/
calm environment?*

*Light
Colour
Scent
Sound*

*Smart
Speaker*

*Aroma
Diffuser*

*Ambience
Lamp*

*Ambience
Products?*

What is the use of aroma diffuser?

Are people aware of this product?

Why do people need/use Aroma diffuser?

What things can we upgrade/ Redesign?

Can all the elements be combined?

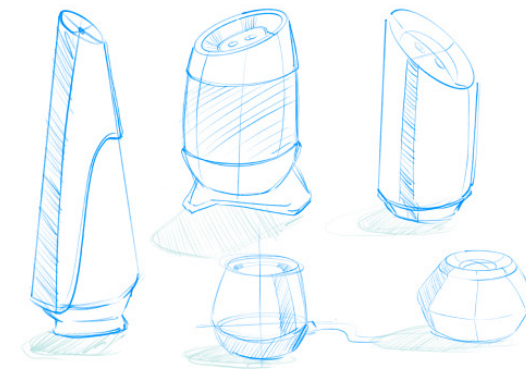
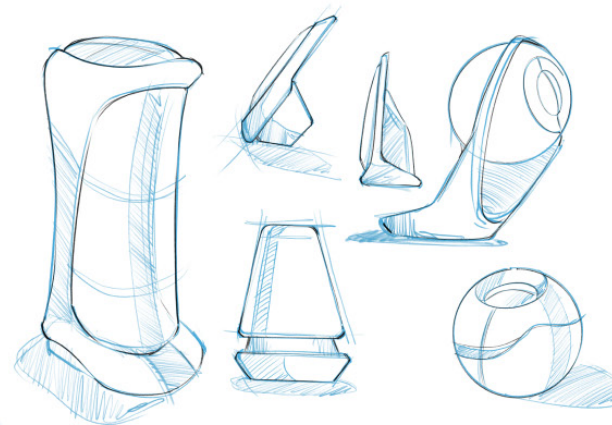
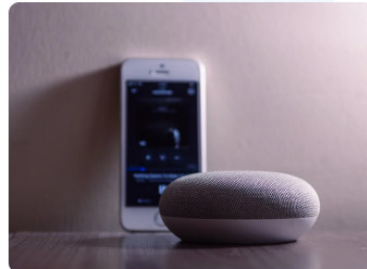
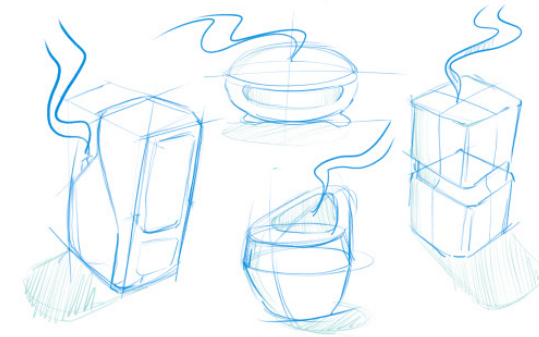
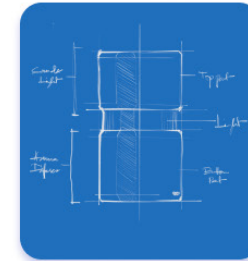
Who will buy this product?

When and where will people use this product?

How will it create a calm and soothing environment?

THE INSPIRATION

came from products that can be disassembled into multiple parts, offering the flexibility to be utilized either individually or as a cohesive whole. Additionally, the project drew inspiration from the airflow patterns, particularly observing how the air emanates from the aroma diffuser.



INITIAL CONCEPT SKETCHES

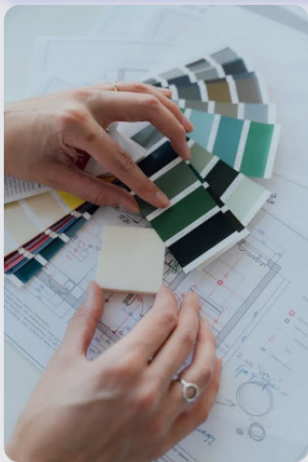
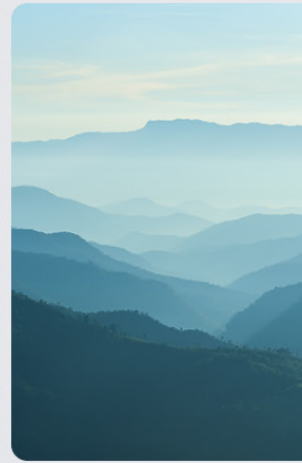
The design started with concept sketches, drawing inspiration from a range of existing products, notably those with dual functionality. Additionally, cues from nature and the surroundings played a pivotal role, guided by keywords such as calm, soothing, smooth, and soft. This approach ensured a synthesis of practicality and aesthetic appeal in the design process.

3.2 Mood board

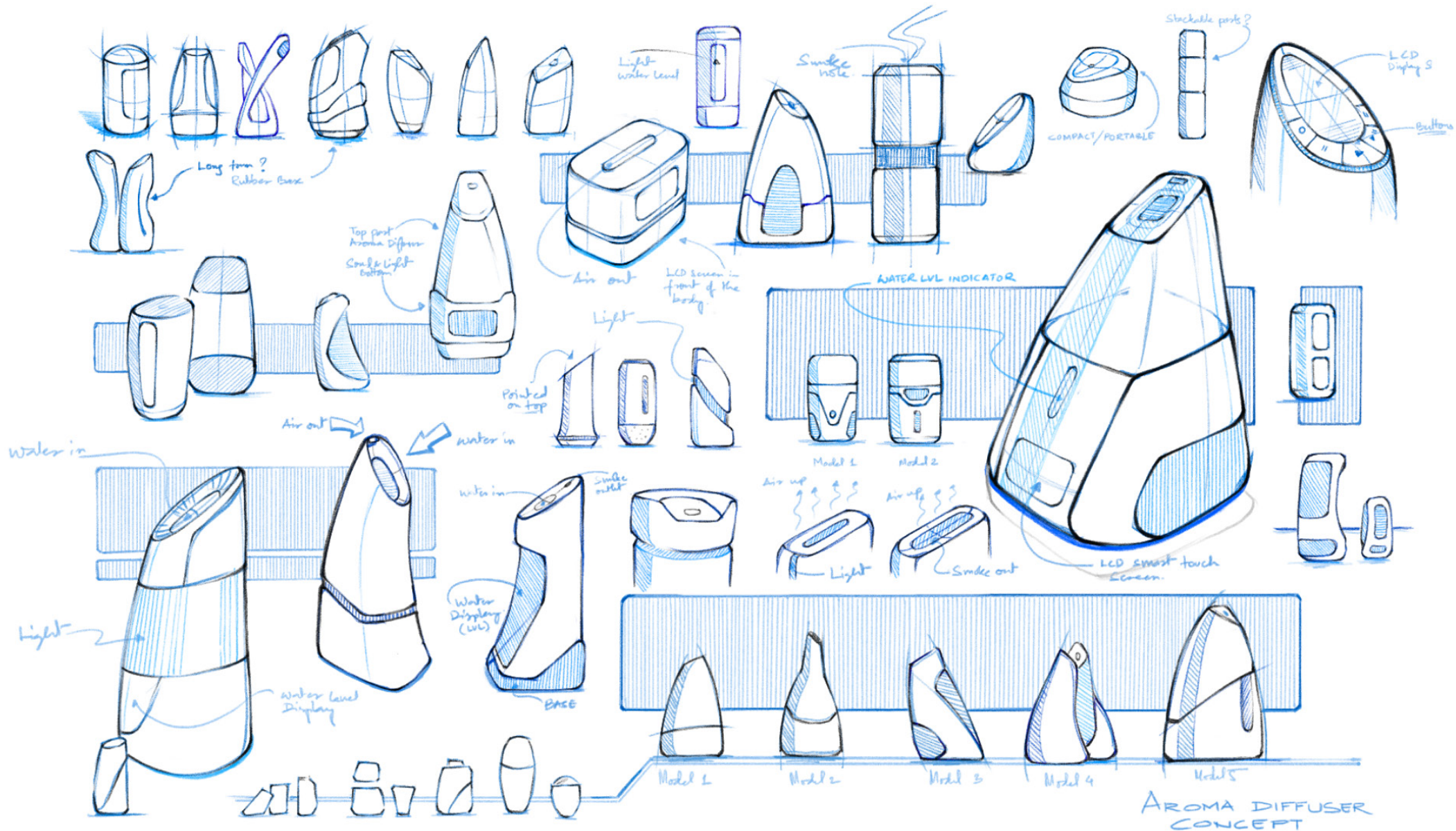
MOOD BOARD

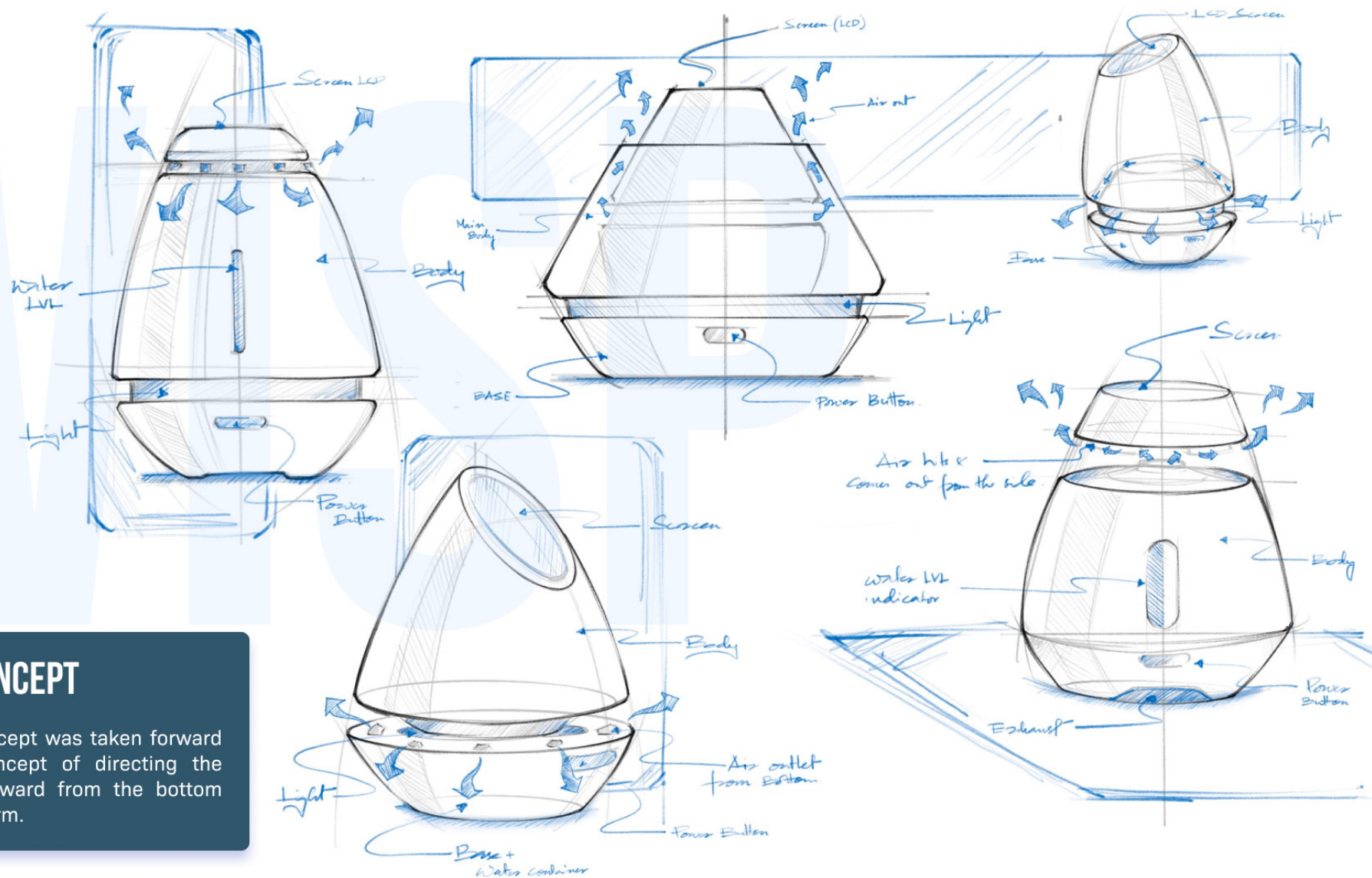
and color palette for the design were intentionally curated in shades of blue. This choice was driven by the calming and serene associations linked with the color blue. In product design, the effects of the color blue on the human mind include promoting a sense of tranquility, instilling a feeling of trust and reliability, and fostering a peaceful ambiance. These psychological effects make blue an apt choice for enhancing the overall user experience and emotional connection with the product.

KEYWORDS: Calm, Soothing, Soft, Cool, Smart.



3.3 Concept Sketches





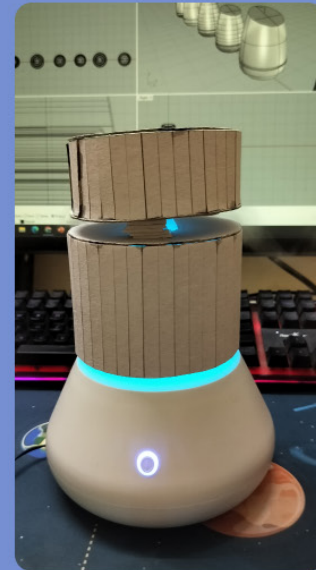
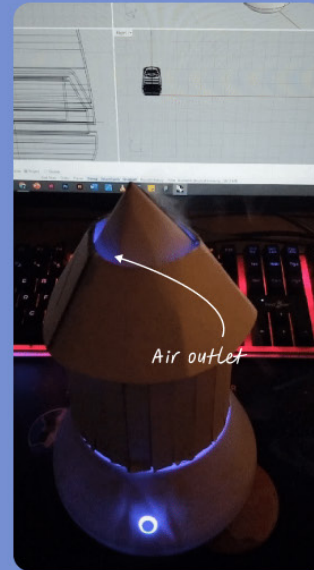
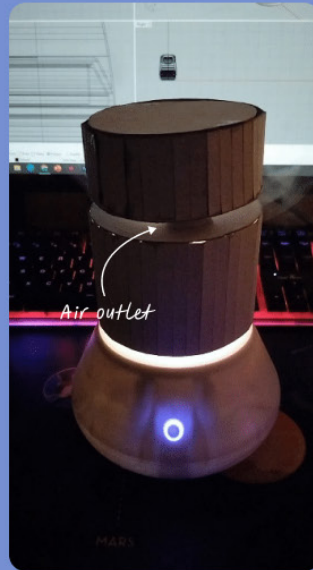
FINAL CONCEPT

The final concept was taken forward with the concept of directing the airflow downward from the bottom part of the form.

AIRFLOW

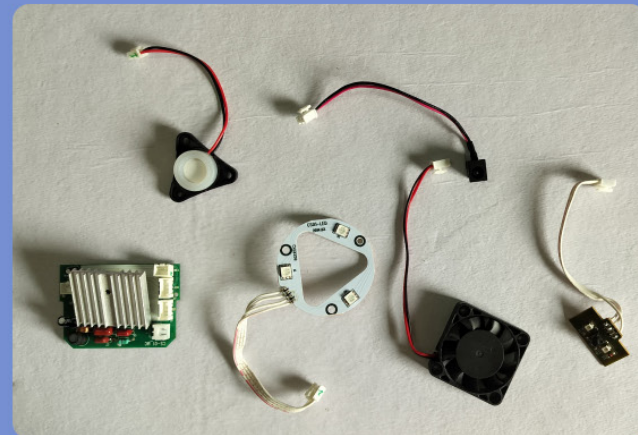
Different types of mist /airflow patterns were ideated using an aroma diffuser and quick mock-up models using ivory sheets to refine our understanding.

In traditional aroma diffusers, the air outlet is typically positioned at the top. The ideation and mockup models aimed to explore the feasibility of having the air outlet from various angles and through different methods, challenging the conventional approach to enhance versatility and functionality.



PROTOTYPING

Following the completion of the design phase, prototypes were crafted utilizing 3D printers. Various electronic components were then incorporated and assembled to bring the design to life. Subsequently, thorough testing and experimentation were conducted with the prototypes to assess their functionality and overall performance.



3.4 Concept 3D form

3D FORM IDEATIONS

Various forms were conceptualized using Rhino 3D modeling software, translating them from the initial concept drawings. Throughout this process, the emphasis remained on maintaining the ability to split the product into two distinct parts



3.5 Final Product

Introducing,

WISP

A unique ambience product that seamlessly blends various atmospheric elements, including light, color, scent, sound, and acoustics. It innovatively combines the functionalities of an aroma diffuser, a smart speaker, and an ambience lamp, providing a holistic and immersive sensory experience.



W
W
S
P

POWER ON
Mode



1

SMART BLUETOOTH SPEAKER

Upper part

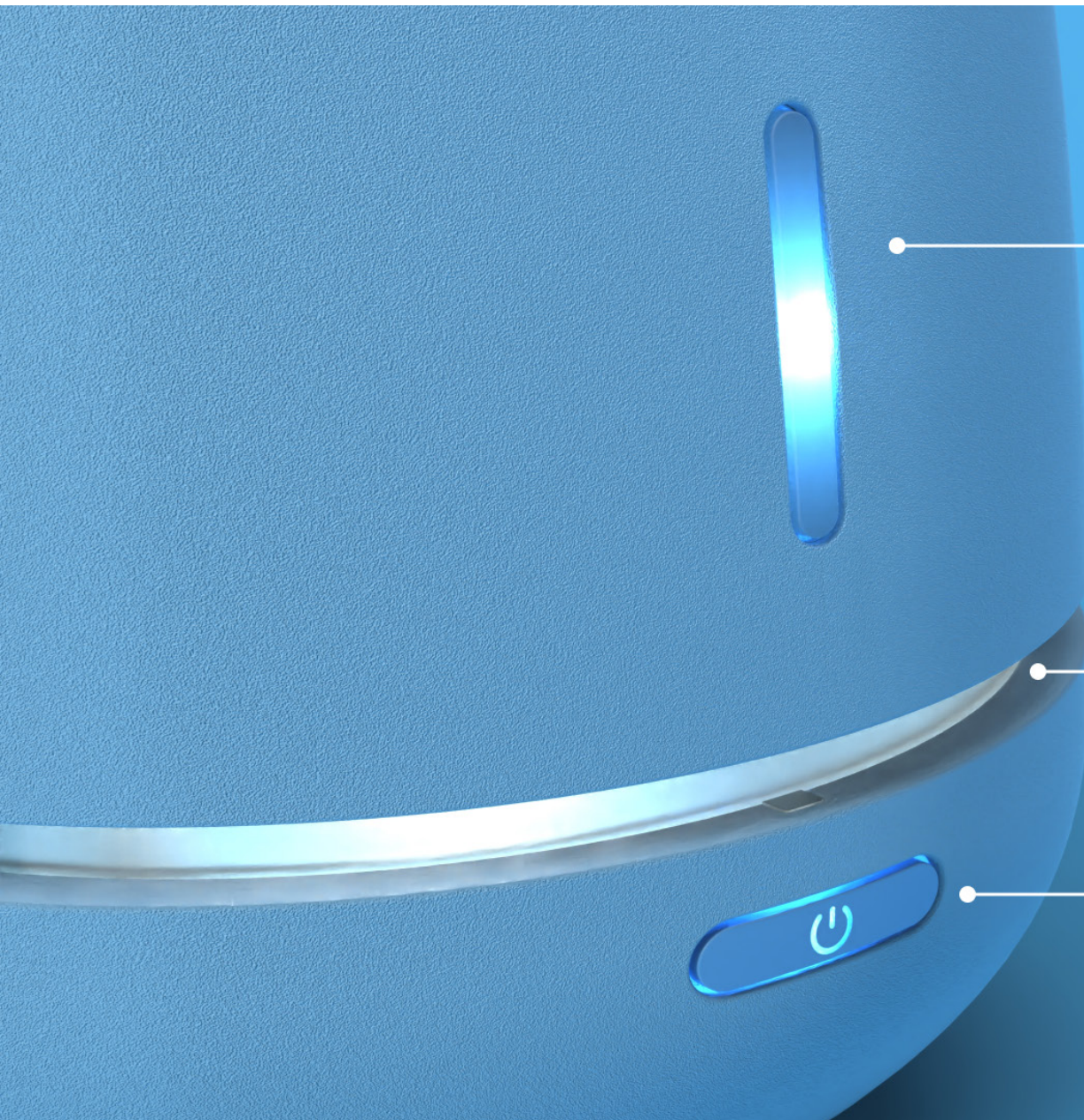


2

AROMA DIFFUSER

Bottom part





WATER LVL INDICATOR

Lighting on/off mode

MIST OUTLET

Downward descend

POWER BUTTON

Aroma Diffuser

LOCK MECHANISM

Press to open

LIGHTING SYSTEM

LED lighting

MIST TIMER

Setting



LOCK BUTTON

Press to open

MIST INTENSITY MODE

Low - Medium - high



MIST INTENSITY

Low

MIST INTENSITY

Medium





MIST INTENSITY
High



DIGITAL CLOCK, CALENDAR
Interactive touch screen



WEATHER DISPLAY
Interactive touch screen



SOUND & ACOUSTIC
Interactive touch screen



ASMR MUSIC
For better sleep and rest

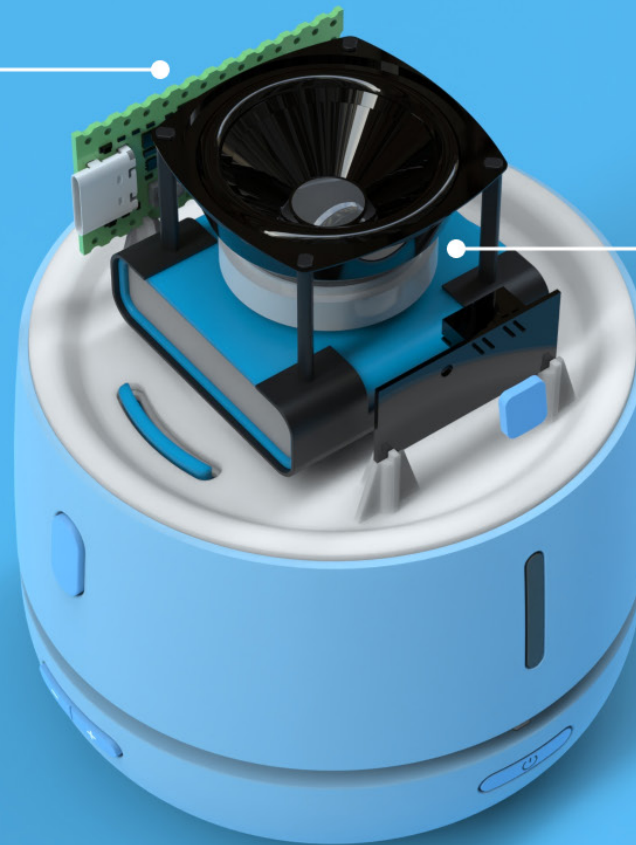
SOUND SLOT
volume outlet

USB - C TYPE
Charging slot 2

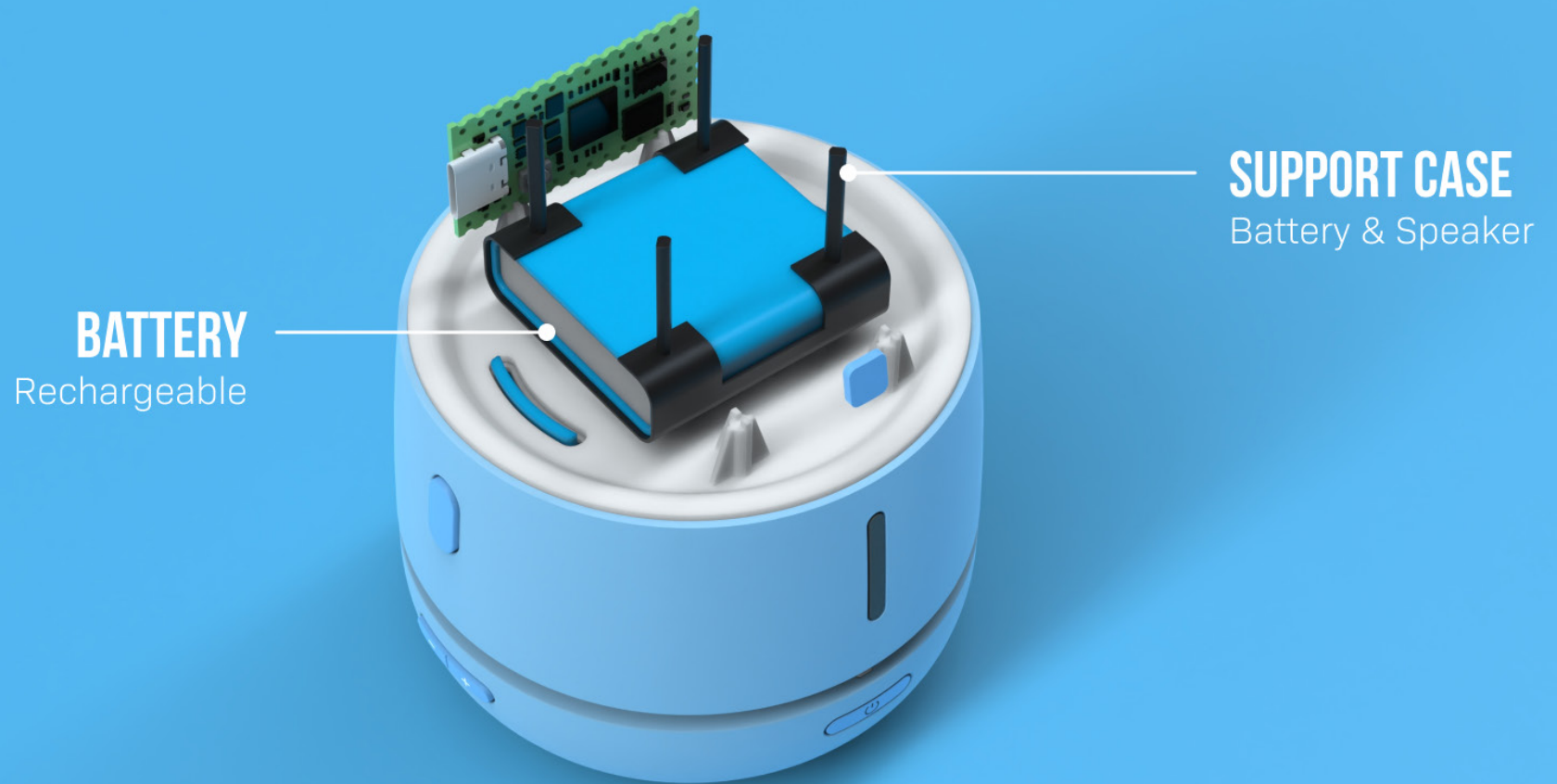
POWER JACK
Charging slot



ARM BASED
Sound effect PCB



SPEAKER
high end sound quality



LOCK MECHANISM

Press to open





WIRELESS CHARGING
For Bluetooth Speaker

MIDDLE SECTION

Leak Proof

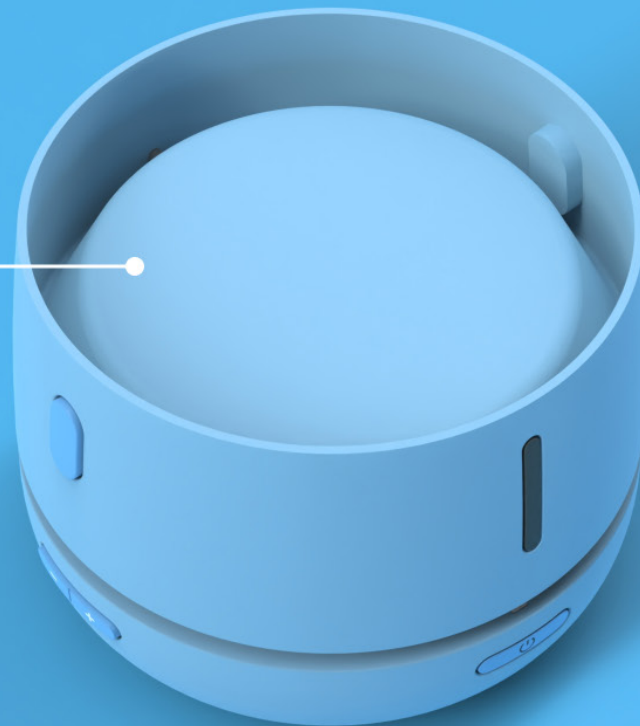
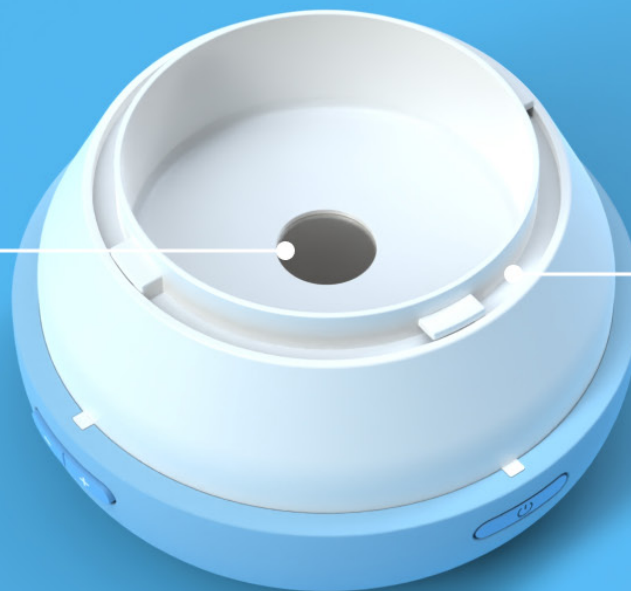


PLATE HOLE

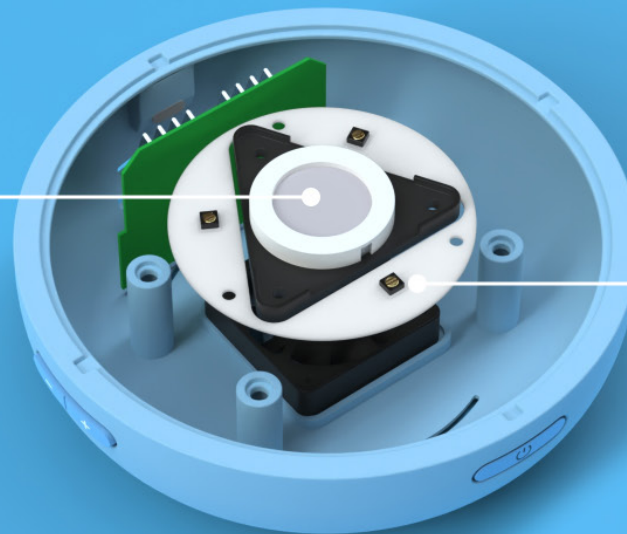
cutout for ultrasonic plate



WATER CONTAINER

For aroma diffuser

ULTRASONIC PLATE
Vibrating mechanism



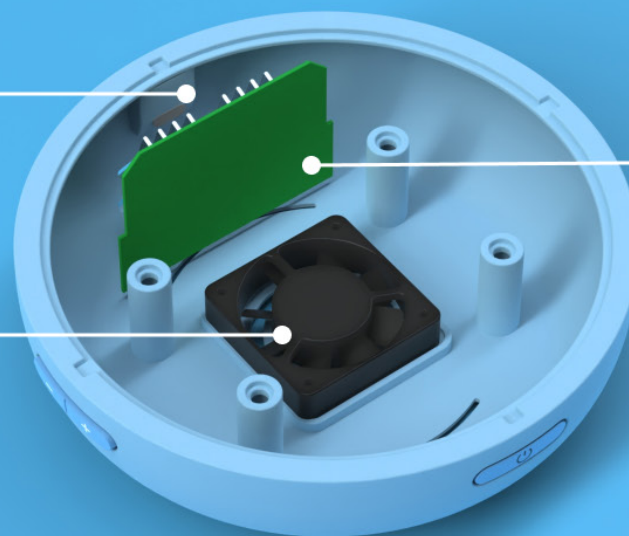
LIGHTING SYSTEM
LED lights

RADIATOR

Helps in Break down the oil

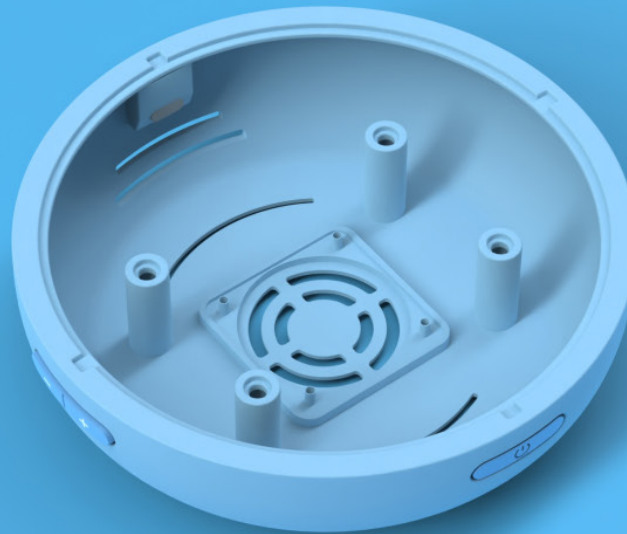
MICRO FAN

For air flow



CIRCUIT BOARD

BOTTOM CASE
with proper ventilation





WISP
TRAVEL WITH YOU

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Product Design II

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