Plantiverse

Listen to the Plants

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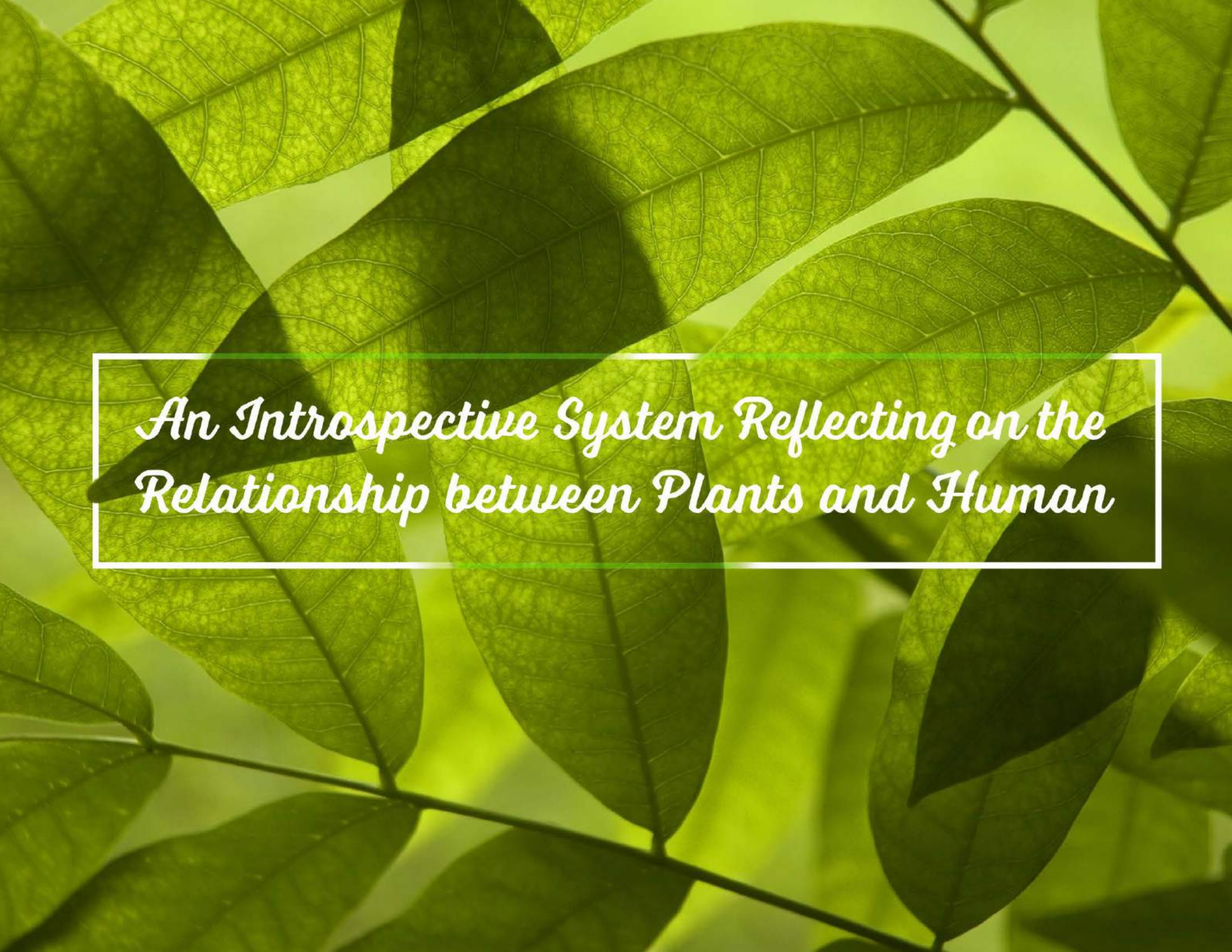
Undergraduate Thesis 2017



An Introspective System Reflecting on the Relationship between Plants and Human

Contents

Project Introduction

01

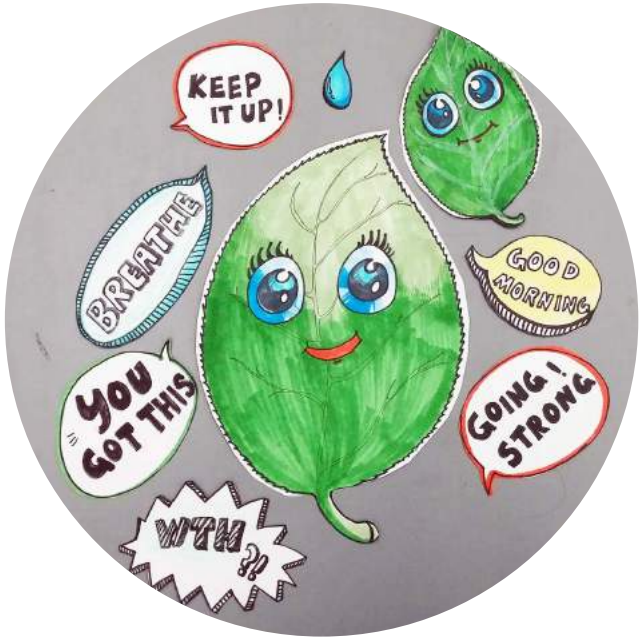
This is a collaborative project between Industrial design, Communication /UI Design, and the core technology developer, Music of the Plants.

This process book introduces our observed problem space, and our design aims. For the long term, we wish that Plantiverse can gain more notice and be accepted among a diverse demographic. Eventually, people can enjoy the intimate interactions with plants and realize that every single plant is an unique individual living being, just like us. The broaden interest and appreciation shall motivate users to make wiser and more creative life decisions. One after another, it may bring positive changes to communities and environment.

We could cure with either medicine or modern technology at this stage, but the real solution could always be from the times that we have forgotten. Auditory is our solution. Through allowing human beings to hear plant voices again, we regain the opportunity to reconcile with plants and to learn about plants from a perspective that we used to know.

As we mature into adults, we tend to lose our profound sense of wonder about the interconnected web of life that surrounds us.

– David Suzuki



For children, they are good at using their abundant imagination to build friendship with objects around them. This type of thinking behavior helps children to be more appreciative and aware of their environment.

Problem Statement

04

Experiments have shown that commons are unable to notice plants in one's own environment. This inability to recognize the importance of plants happens most often in the biosphere and in human affairs. This symptom is referred as Plant Blindness. Plant Blindness is a side effect caused throughout human evolution.

In the past, our ancestors needed to instantly locate and track their prey from jungles, forests, and the prairies. This hunting process required the ability to filter out the unessential in order to acquire precise information. By means our visions are prone to ignore the vast areas of green and only focus on the active moving objects. This survival tip inherited from our ancestors has created problems for our current society. We realize that many regard plants as mute and immobile furniture. Plants are not given enough credit for their contribution and thus are not being protected and sustained. Plant Blindness may seem harmless to individuals, but once added up it certainly brings negative impact to our Mother Nature.

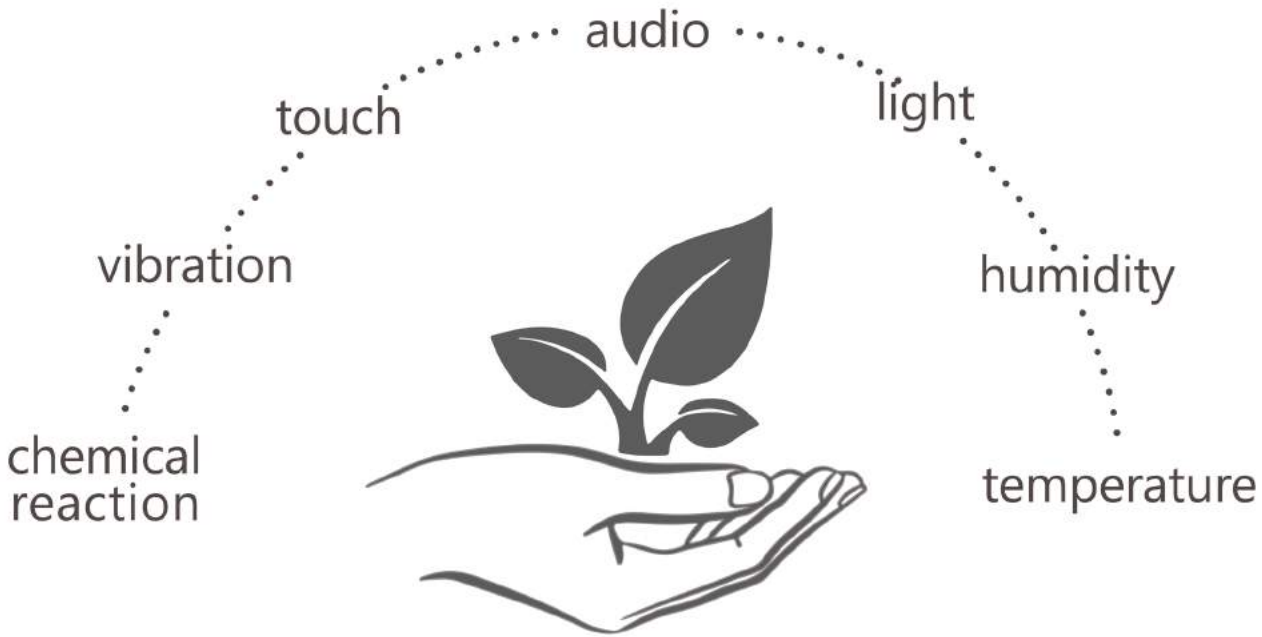
If we would like our many to come generations continously enjoy the fascinating Mother Nature, it requires us to make immdiately resolve thos harmful issues. Global warming, Climate Change, Loss of Biodiversity, Deforestation, Ozone Layer Depletion, and Water Pollution, so on so forth. These enviornmental

99.7%

of the biomass on the planet

plants

they are the essence of
the whole eco-system



however, many do not know that plants are just as conscious of their surroundings as we humans are

Opportunity

07

The goal of this project is to challenge and alter individuals' perspectives. The intention is not to promote any particular life choices such as the vegan lifestyle, the ongoing activism of zero-waste, or anti-consumerism. Instead, it is to encourage critical thinking and make subtle changes in daily life decisions. Subtlety greatly and easily helps people embrace new concepts.

With all the social and environmental awareness happening around the world, two different opinions emerge. There are the ones that are passionate and supportive, and the ones who are bothered and disagree. Other than holding different viewpoints, people may not fully understand the notion of being advocated or they feel that their original lifestyle is threatened. Plantiverse wants to bridge the gap. By avoiding bold statements and set obligations, Plantiverse approaches people in a more fun engaging and moderate manner.

You will observe in our later iterations that our approaches varies accordingly to the target users.

Solutions

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Iteration I

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Problem Space

As technology advances rapidly nowadays, many younger generation tend to spend more time socializing in the virtual world, and lesser time physically with their parents or grandparents. This symptom is one of the contribute cause to the rising number of lonely uncared seniors.

In respond to this issue, some seniors will choose to be taken care of in senior homes. Others choose to stay residence in their homes and hire professional caregivers. There are also many seniors who keep pets as companions. And there are of course seniors who enjoy spending time with plants. In fact, studies has shown that gardening offers many valuable health benefits in return. Planting is a happy simple activity for individual and multiple. Family and friends can enjoy plants along with the seniors to lower stress, reduce pain, decrease need for medications, heal emotions, and much more positive outcomes.

Our Goals

To create a device that could enhance the relationship between seniors and plants. Let the plants give more tangible feedback to seniors, making plants greater companions.

We want plants to strip away from the static stereotype, and become live active companions. The plants could also become a daily assistant, to provide not only companionship, but also convenience to the seniors.

We want people to think of seniors as a sustainable character just as plants, just as the roots the source

How Might Design
create an accessible, stable, spiritual company to assist and enhance life qualities for seniors?

Research

Both primary and secondary research were conducted. From both research methods, we wanted to learn scientific facts of plants' intelligence, how they connect with their surroundings, how their needs are indicated. And from there, we could design a system that utilizes these plants' instinct to assist elderly's daily life rountine.

Primary research was a questionnaire we designed for senior participants to fill in.

We conducted a simple questionnaire to gather some first-hand resources.The senior participants were randomly selected from a wide range of demographic, including family members, friends, and coworkers, and pedestrians.

The questionnaire allowed us to a better understanding of senior's private lifestyles. Some of the answers we received were surprisingly out of expectations; while others matched with our research assumptions.

A. HOW DO YOU SPEND MOST OF YOUR TIME? INDOOR AT HOME OR OUTDOORS?

1. prefer outdoor activities because sunshine
2. enjoy indoors, enjoy reading and pet
3. spends almost equal time indoor /outdoor
4. indoors, it provides comfortable and securiness

B. DO YOU PREFER MORE ALONE TIME OR COMPAIONSHIP?

1. companionship, support
2. comanionship, two is better than one
3. prefer more alone time
4. prefer alone time, because it is quiet which provides me the time think and do creative works

C. DO YOU ENJOY KEEPING PETS?

1. afraid of animal, also not enough space and sanitary concerns
2. enjoys pets, in a way it strengthen relationships between family members
3. enjoys pets, but prevent any breeding
4. human and animals should be in seperated living spaces

D. DO YOU ENJOY HAVING PLANTS?

1. one plant is fine but not too many, keep it clean and lovely such as orchids
2. does not enjoy, because plant pots can cause dirt and dust, not attractive enough not much reaction
3. not against plants, but afraid of the idea of facing death

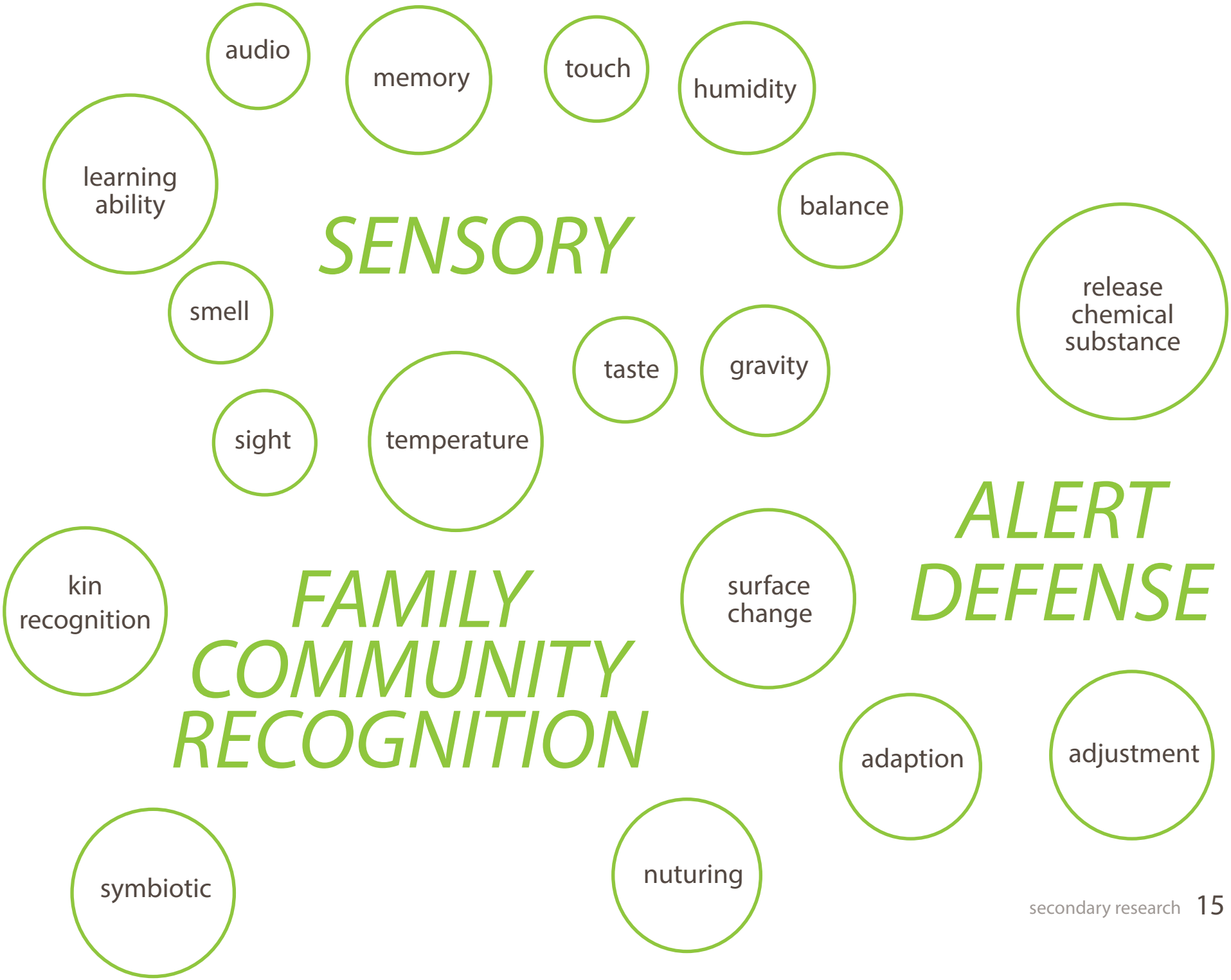
E. DESCRIBE YOUR MOST MEMORIABLE EXPERIENCE WITH YOUR SIGNIFICANT COMPANY (HUMAN/ ANIMAL/ PLANT/ OBJECT)

1. enjoys spending time with family, especially grandchildren, watching their growth and development
2. haven't seen her cat for a long time, she was hesitant about the cat's reaction, afraid that the cat wouldn't recognize her. But once she stepped into the house, the cat came running and jumping onto her

F. DO YOU USE ANY TECHNOLOGY IN DAILY LIFE? WHAT DO YOU USE IT FOR?

1. wechat, contact friends, text messages, information about health
2. facebook messenger, contact family and friends
3. use technology for music, relaxation, meditation, and share positivity messages

For secondary research, we watched and read many documentary on plant nature. Their consciousness and capabilities, and their interactions with preys, the enviornment, and their own species. We were utterly suprised by the knowledge that plants have many clever survival mechnasims. We've realized that plants are very underappreicated not only by their contribution to our living environment; but also their evolved surviving intelligence. Some people may argue about using the term "intelligence", because usually the thinking and decision making process involves an organism brain. However, it is no doubt the incredibility of how plants can complete and sustain their life circles without brain and nerves. Plant's incredibile and commonly unknown abilities can be classified under three major categories.


audio
memory
touch
humidity
learning ability
balance
SENSORY
smell
release chemical substance
taste
gravity
sight
temperature
ALERT DEFENSE
kin recognition
FAMILY COMMUNITY RECOGNITION
surface change
adaption
adjustment
symbiotic
nuturing

Precedent Research

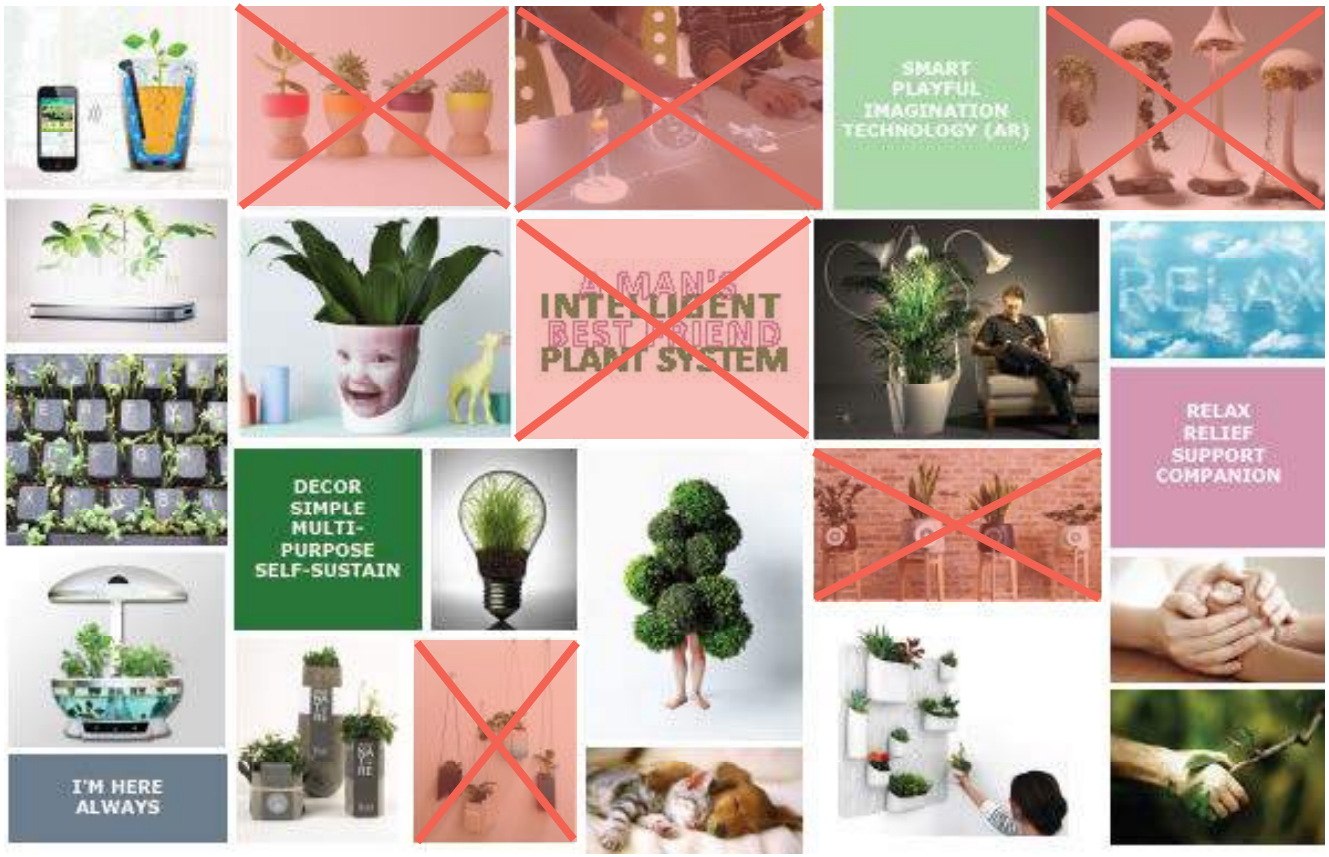
There are many precedents of seniors assistant. It comes in a variety of form, can be traditional technology such as human-like robots. It can also be modernized technology that are much more ergnomic and handy, such as fitbit and health monitor devices.

We made a list of pros and cons analyzing each device model.

top category
early years robot assistants,
clockwise: Kompai, Carebot,
Beyond Roomba

bottom category
modern health assist tools,
clockwise: smart health watch,
Bella Beat Leaf, Lapka

Moodboard



- avoid using decorative
- visuals. emphasizing on the idea of how plants can be multi-functional.
- focus more plant's awareness and them inhabiting their own language. how they exist in human's life.
- no more complex visual reality approach, but rather a more straight forward interactive surface (app).


NATURE
STORYTELLING
RELIEF
HOLY
BELIEF
VULNERABLE
FREEDOM
SENSE OF BELONGING
SUPPORT
COMFORT
FAITH
SPIRITUAL
PRECIOUS
ATTACHMENT
COMMITMENT
SHARE
RELIGION
SENSORY
HOPE
MEMORIES
RELIABILITY
IMAGINARY

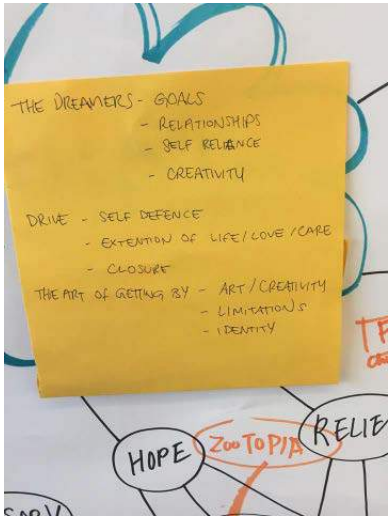
Inspiration Story

Two painters, Johnsy and Sue lived together in Greenwich Village. The young painters and work hard on their paintings. With winter quickly approaching, Johnsy get pneumonia and becomes very ill. She thinks she is dying. She looks out her window and decides that when the last leaf falls from the vine growing, she will die.

Behrman is an old man who lives in the apartment building with Johnsy and Sue. He hears about what has happened to Johnsy and decides to help. He is a gruff man, and no one thinks much about him. He hasn't worked on his own painting in over 40 years, but paints a vine with a leaf on it. He puts it out side of Johnsy's window and she sees the leaf is still there. Behrman catches pneumonia and dies shortly after finishing his painting. The leaf that he has painted saves Johnsy's life.

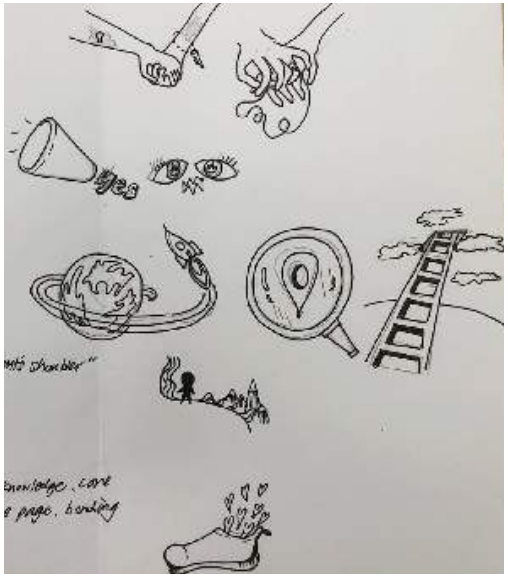
Exploration I

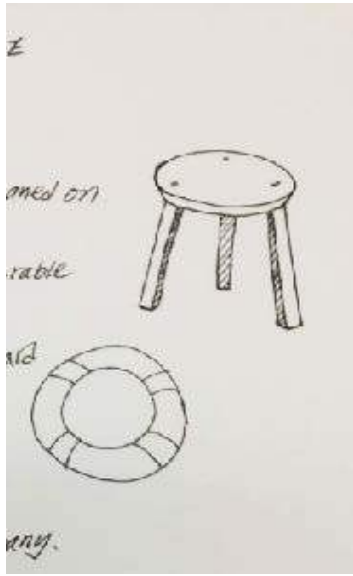
Started from the word SPIRITUAL, branch out all the primary and secondary connections. Some connections require deeper and out of the box thinking in order to make sense.

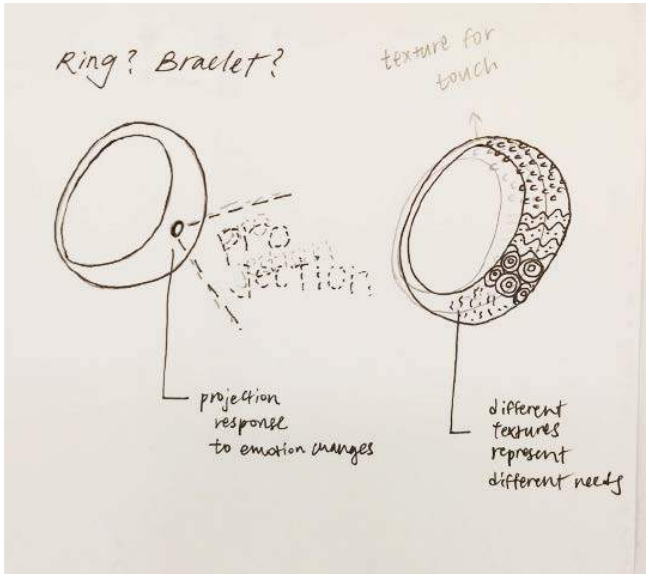


We used pink post-it notes to randomly select keywords for eachother. the keywords are for later design exercise. the exercise were done repeatedly every 2 days for one week.

Exploration II

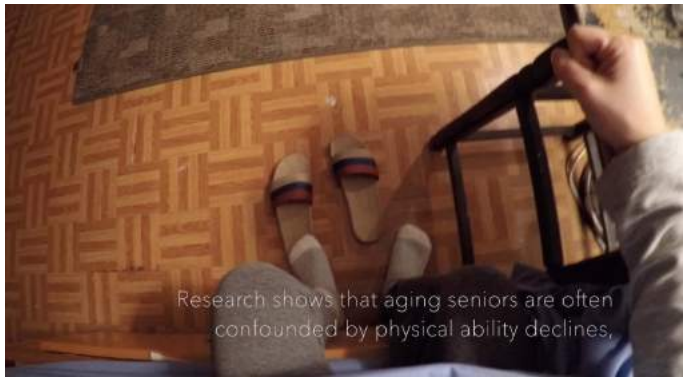






randomly select three keywords from the spiritual moodboard. define and expand on the definition and associations that comes with the term. Sketch out visual ideas by combining the essence of the three keywords. Roughly design objects that embodies the function of the keywords. these early stage designs can become reference for later product or package designs.

Video Prototype



A short video clip we made for video prototyping. It demonstrated the mental and physical challenges seniors face on regular daily basis.
We focused on the notion of losing and retracing one's sense of belonging.
The protagonist in this video is a senior who lives on her own. She is capable of completing basic daily tasks. However, the lack of companionship makes her feel sad, empty, and lonely. She owns a pot plant, but other than touching the leaves and appreciating the greenness, the senior does not interact much further with her plant.

Exploration III

HAIRSTYLE OUTLOOKS

FACIAL EXPRESSION

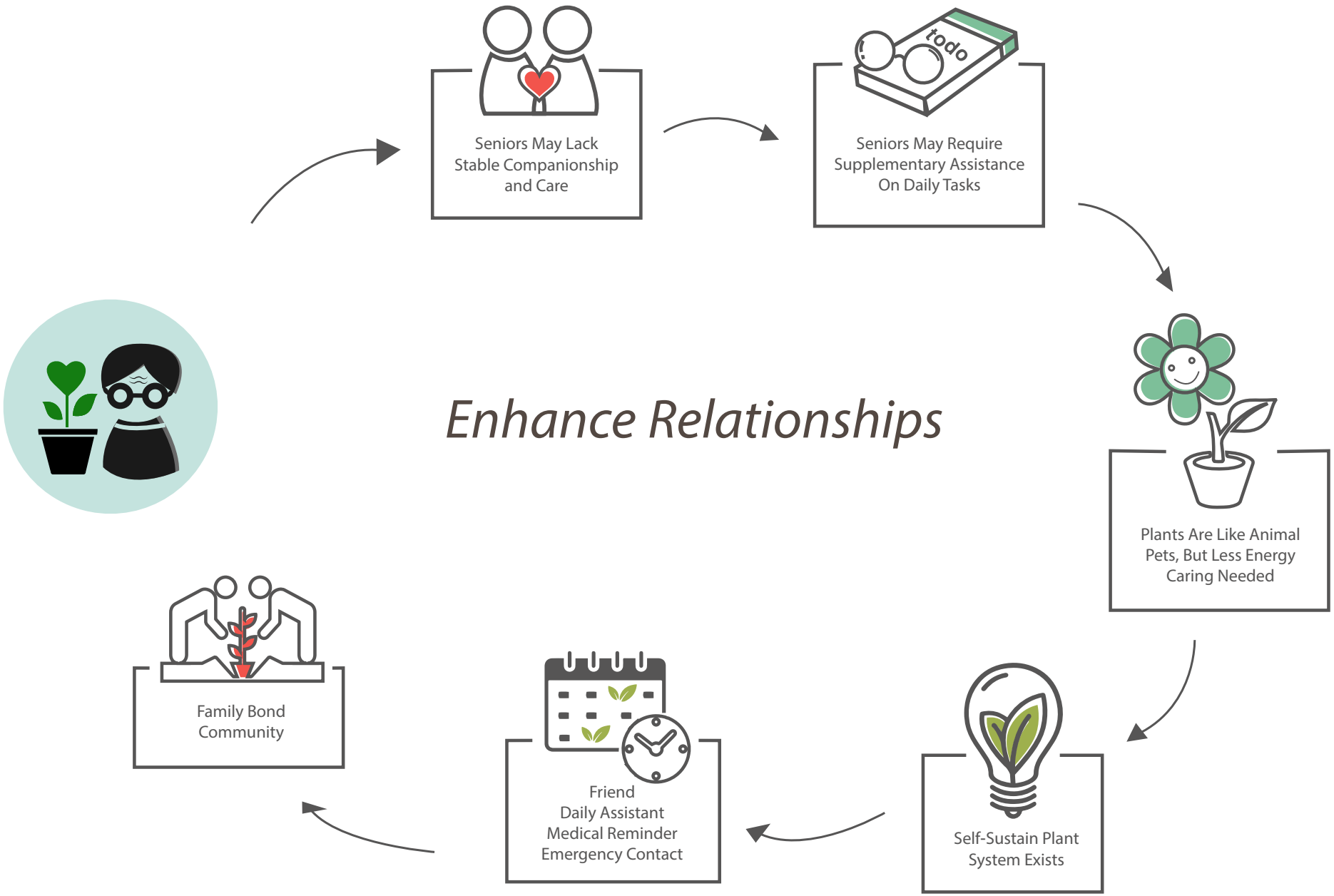
COLOR

SCENT & TEXTURE

Reflections

We found that the meaning of making plants become a stronger and more versatile compainion was not clear enough. Plants, in a sense, are already human's companion. In order to giving a deeper connection between the two, the method shouldn't be by giving the plant more functions, but rather an emotional or a spritual connection.

Interestingly, what surprised us through the research was that there are a lot of knowledge about plants that we didn't know about before. And mostly importantly, those facts about plants are totally against our common understanding about plants, which also changed our perspective about plants in a way.


Enhance Relationships
Seniors May Lack Stable Companionship and Care
Seniors May Require Supplementary Assistance On Daily Tasks
todo
Plants Are Like Animal Pets, But Less Energy Caring Needed
Self-Sustain Plant System Exists
Friend
Daily Assistant
Medical Reminder
Emergency Contact
Family Bond
Community

Iteration II

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Do you see the Plants ?

Plant Blindness

Plant blindness is a very common problem in current societies. The term refers to a lack of appreciation for and understanding of plants. It is one of the main causes that slows down promoting sustainable living. Most people don't pay attention to plants and the fundamental role they play in maintaining life, society isn't likely to agree that plant conservation is among humanity's most crucial issues, much less support plant science research and education. All this while, by some estimates, one in eight plant species is threatened with extinction and the human population continues to climb.

Our Goals

To encourage people to reconcile with plants by solving plant blindness. Through interacting with plants via games and rewards, people could gradually learn about different plants from multiple aspects. Ultimately users would, through this process, improve their awareness of the plants in the surrounds, and change their conventional perspective on plants, which would lead to better regards to the plants.

How Might Design

remind those people living under a fast-paced lifestyle, to reconcile with plants by solving Plant Blindness?
To remind them to slow down, engage and recognize the value of plants' existence?

Concept Development

We did a little exercise to clarify our thoughts from all the previous plant researchs. We ask ourselves to brainstorm all the relationships between human and plant nature.

We first ask ourselves...

Why don't plants have enough existence?

1. Not being regarded as alive
2. Their movements are way too slow
3. They don't have a verbal language
4. They are usually regard as a decorative visual pleasure "accessory"
5. Too subtle changes on social behavior
6. We take their contributes for granted
7. Too many varieties, hard to differentiate, overwhelmed by information
8. No comparison, such as in a desert, we do cherish and recognize it
9. There are no stimulation, they are largely static. We lump them into geren background.

We then ask ourselves...

What are the times that human may notice plants or need them?

1. Food
2. Resource
3. It used to be there
4. Decorative
5. when it is dieing
6. When it appears or grows at an unusual place
7. When scientists proof that certain plants could be used as meditation, or other new usages
8. If it could be introduced differently

Last, we ask ourselves...

What features allow a product to be popular? And how do we measure its success?

1. Trading feature
2. Rewarding feature
3. Creates a community, a phenomenon
4. Take care of different groups ' own needs:

a. For people who prefer to stay home, the could comfortablely explore new things through internet

b. collect, make up, compare with different information

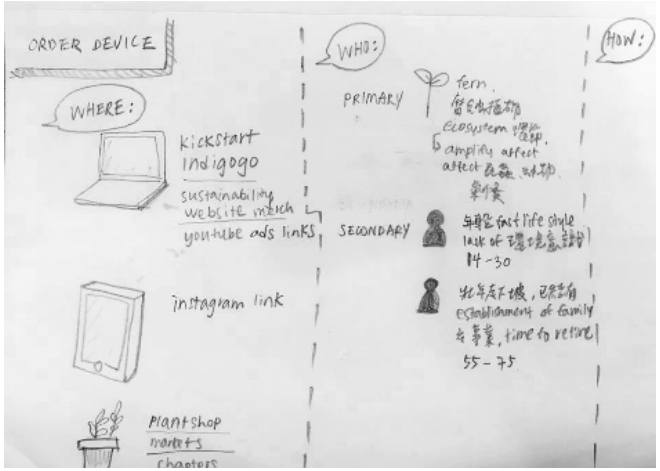
c. For people who are busy, they prefer things that are easy to access, things for relaxation or joining part of a conversation that is tangible and helpful

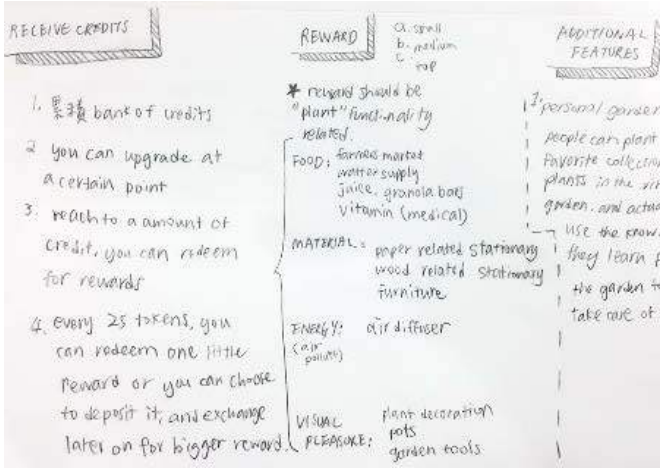
d. For children, they prefer activities and features that are fun, and for their parents, they prefer educational things for their kids

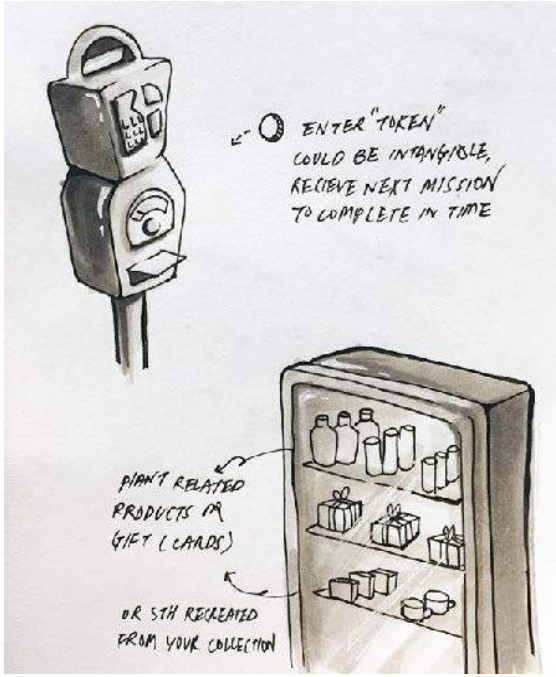
5. The product (design) shall have additional , secondary value constantly updates for better

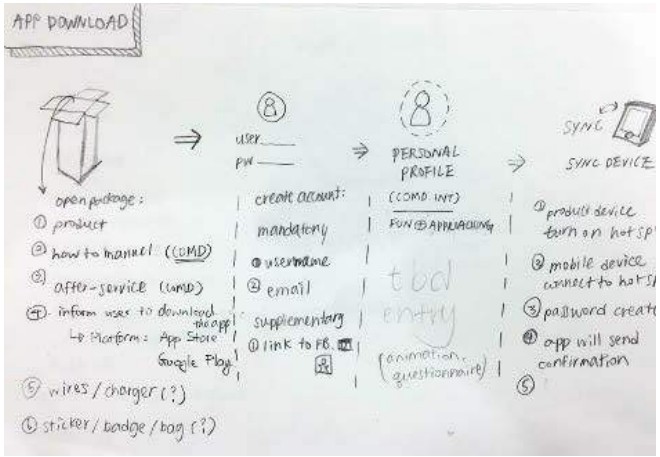
Rough sketches of how the rewarding machine shall function and look like.

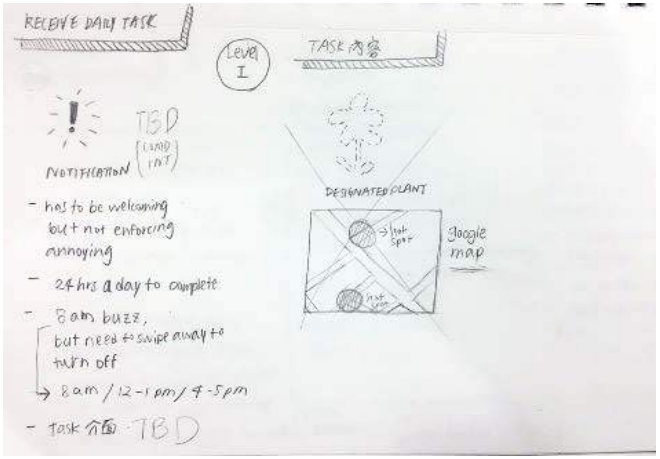
A brainstorm activity we did on examining exsiting objects in life that were invented in the pupose of enhancing its orignial function. Through the study of precedents, we hope to find out certain regularities and similarities.





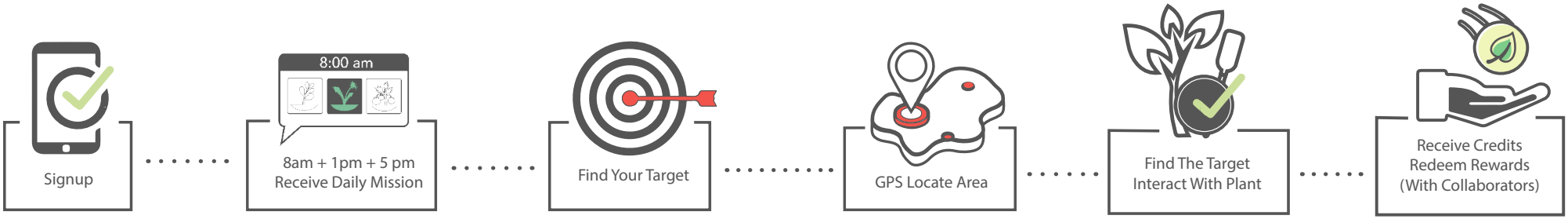






App System Ideation

+ REWARD SYSTEM



First of all, once the user activates the app for the first time, he/she will be asked to register an account and sign up.

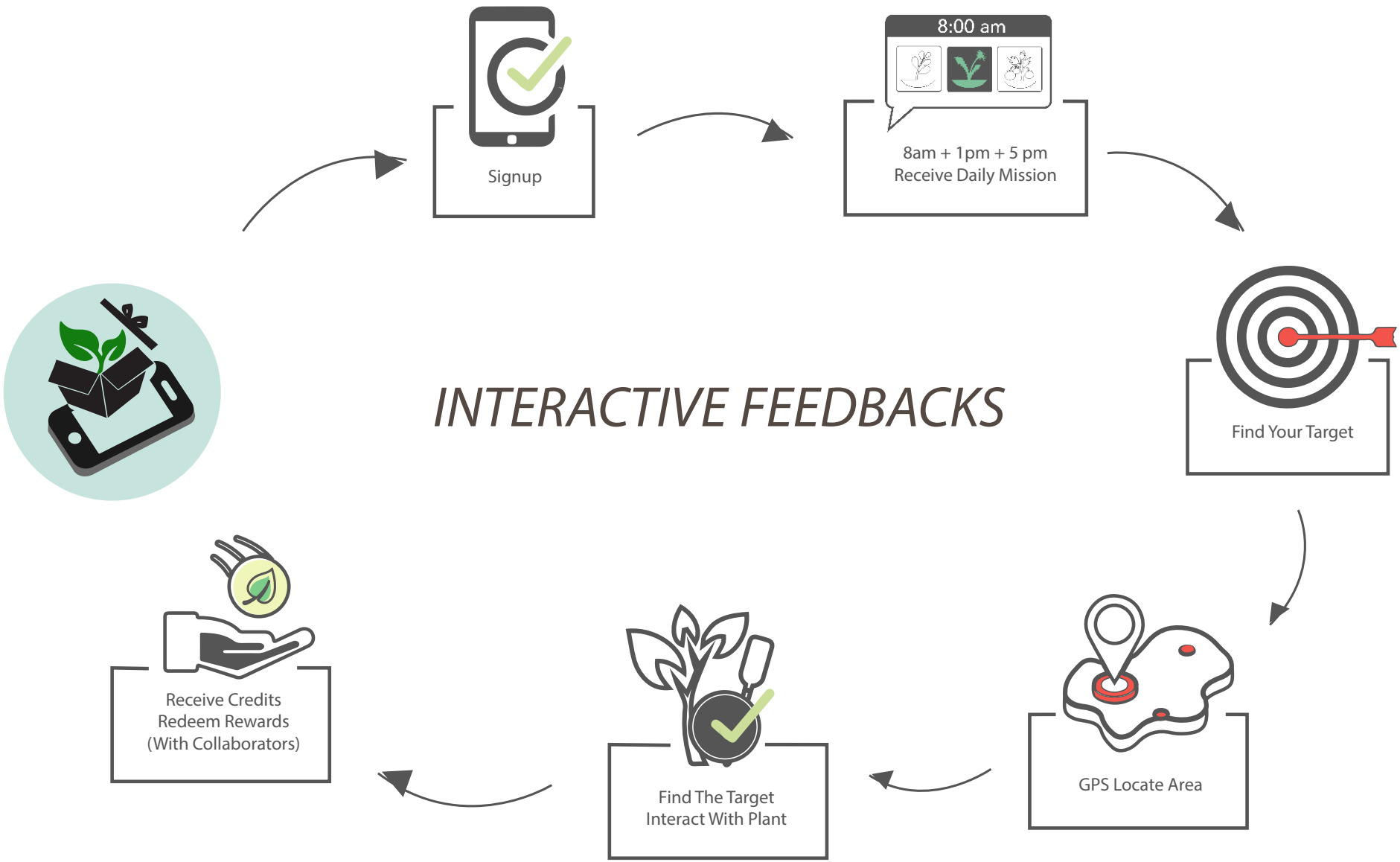
The app will send out a daily mission, asking the user to find out at least one of the three plants that it randomly gives out. There will be three reminders about doing the mission in a day

After the user accept the mission, he will go out and start to find his/her target plants.

The GPS in the app would provide a rough area of where the target plants will be at, but once the user enter the given area, it would be completely up to themselves to find out where the plants are.

Once the user successfully find the target plant, he/she would need to user the device, as evidence of their presents, to collect data from the plants.

Once the device receive the plants confirmation signal, the app would acknowledge the users' completion and grant credits to their account. The credits could be used later on to redeem certain prizes.


INTERACTIVE FEEDBACKS
Signup
8:00 am
8am + 1pm + 5 pm
Receive Daily Mission
Find Your Target
GPS Locate Area
Find The Target
Interact With Plant
Receive Credits
Redeem Rewards
(With Collaborators)

Reflection

In the later exploration process, also after we have gathered feedback from instructors and other students, we found out that the device in the system isn't providing enough information in ragard to plants.

Also, since the system is rewarding based, the type of reward really matters here in order to attract users. However, the entire system is not specifically targeting plants as much, and it takes away the attention to plants.

What we did picked up from this iteration was the reassurance of designing things based on what the plants are capable of. The usage of the plants' their own awareness of surroundings is an interesting area worth exploring.

Iteration III

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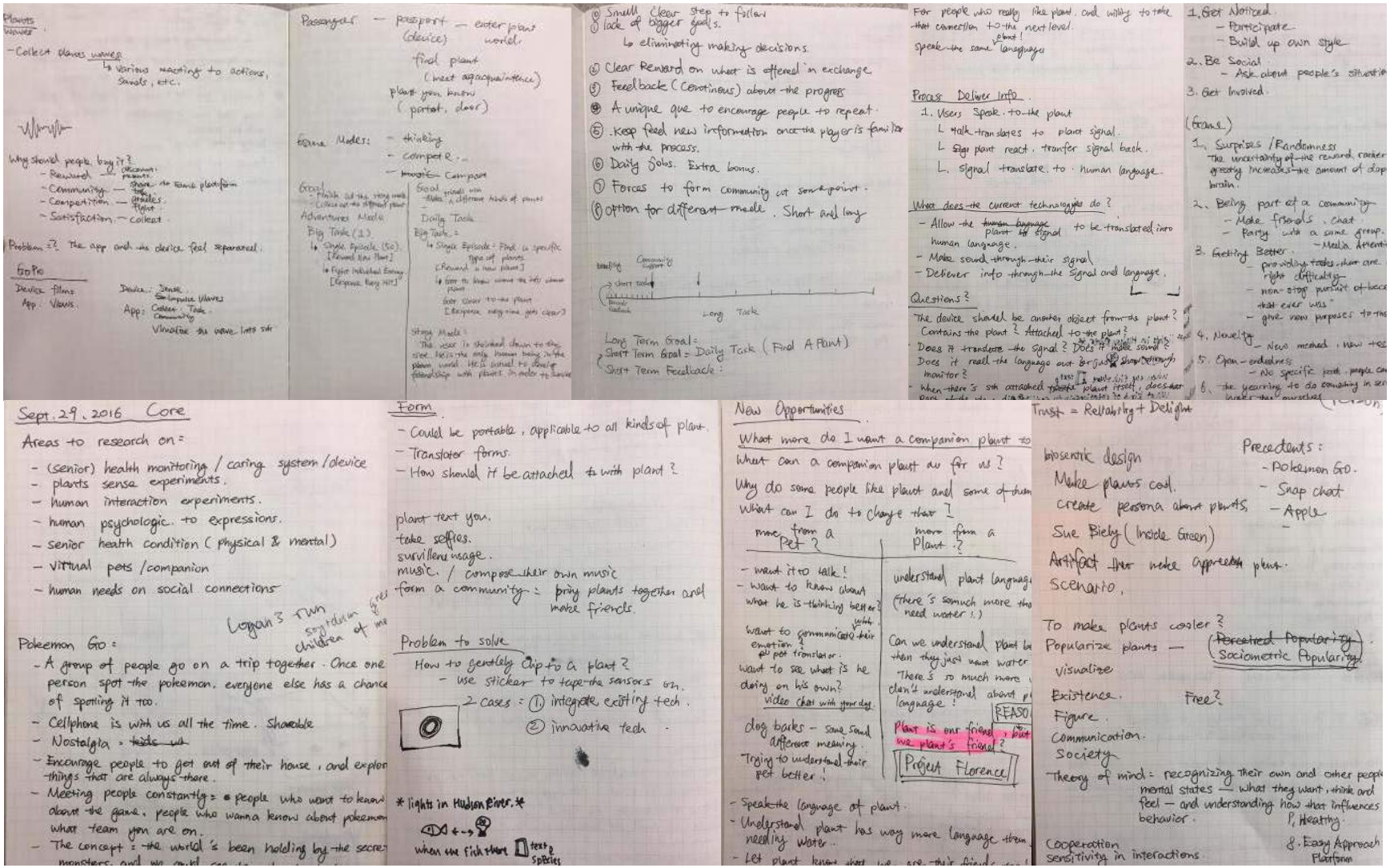
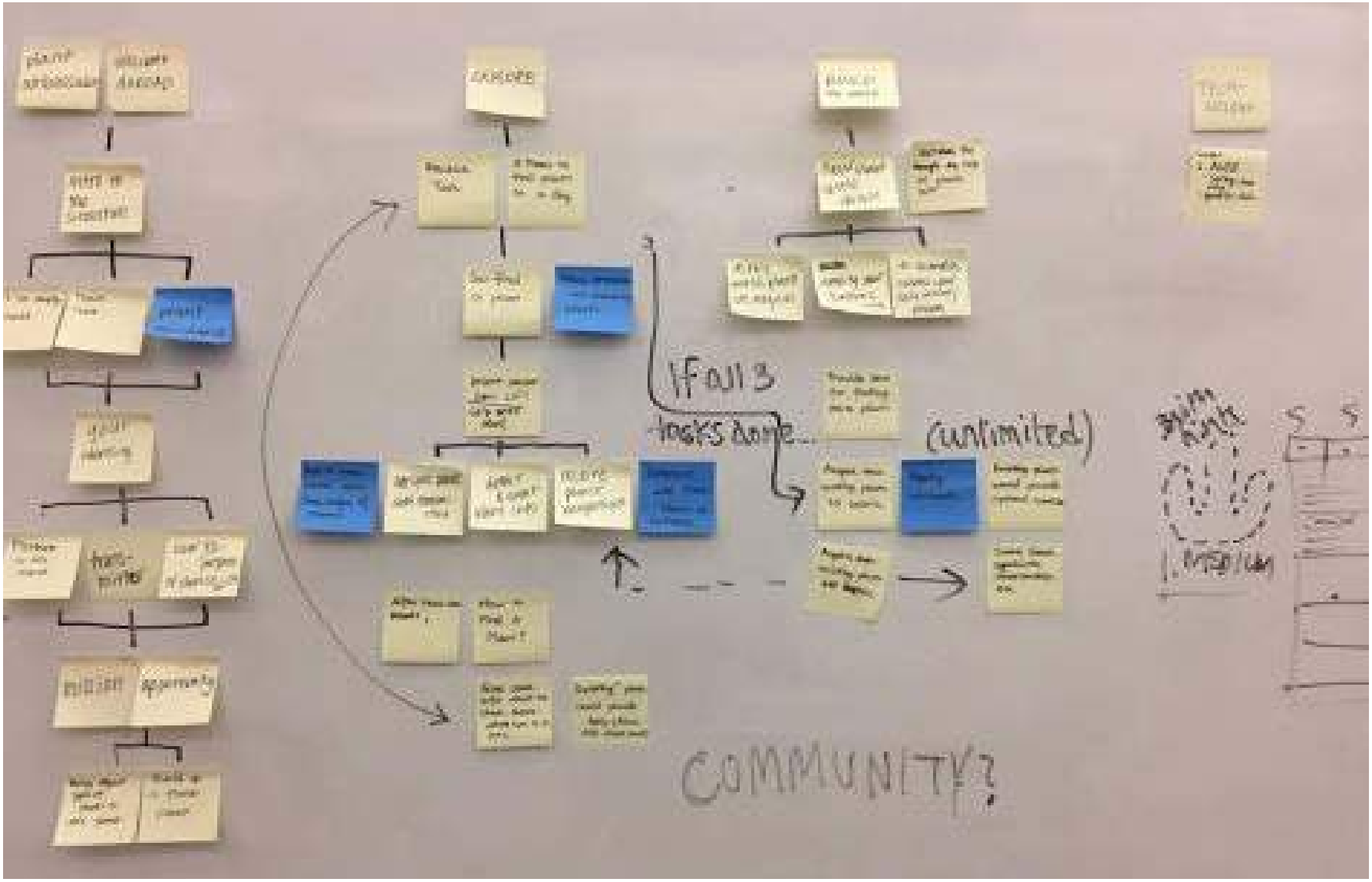
Our Goals

Learning the pros and cons from the last iteration, and also through research, we found that there aren't many plants based games that are designed from their perspective. Also, if there are more interactions between the actual plants and human, rather than just virtual plants (which was 90% of the case), it could make people pay more attention to the plants around them.

Concept Development

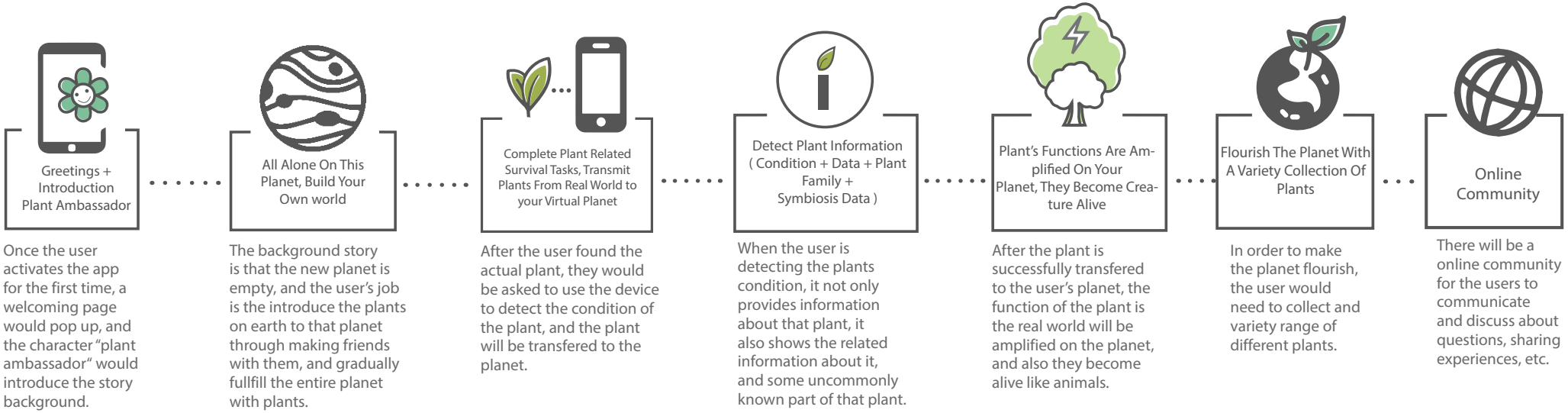


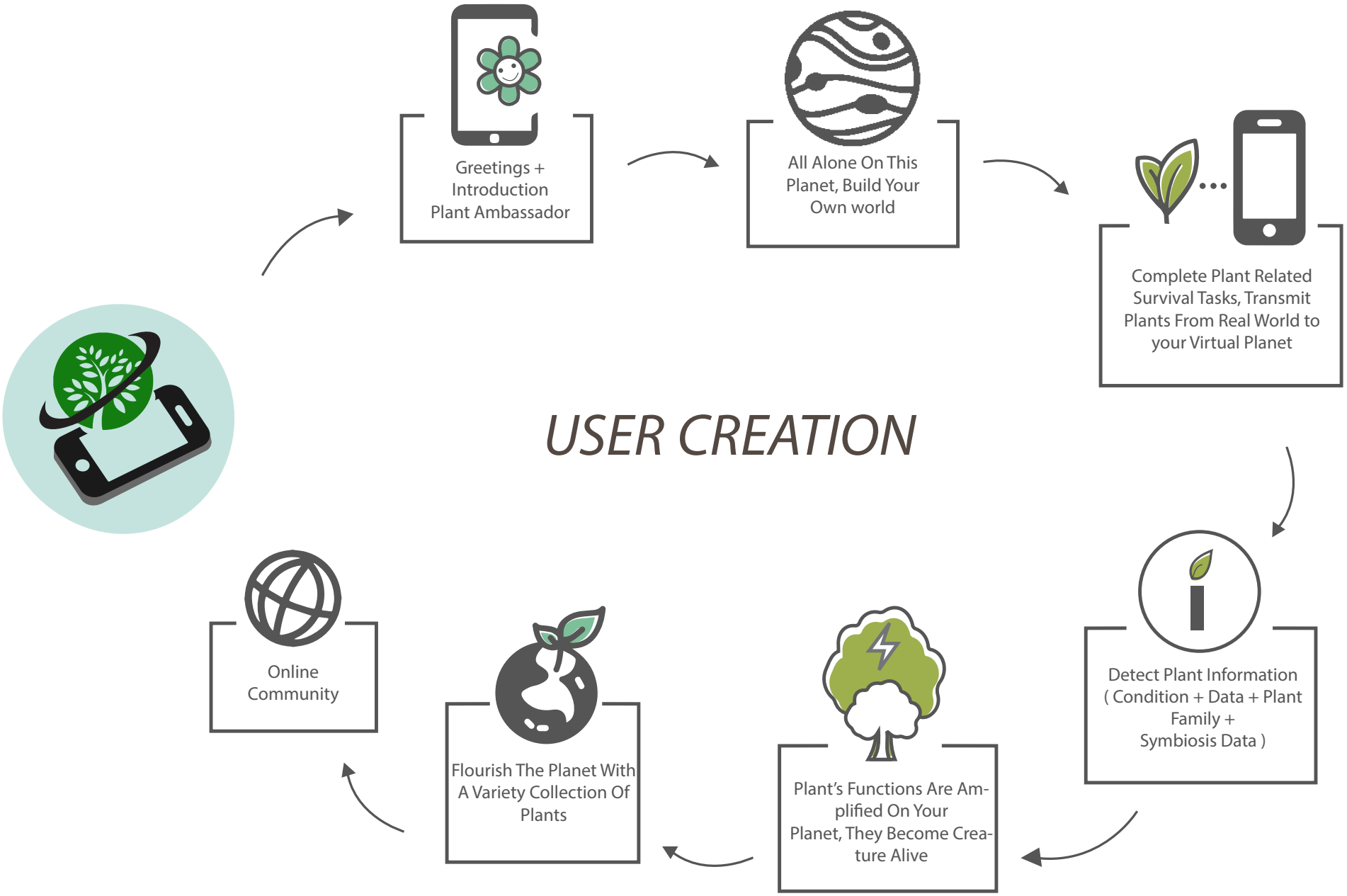


We transformed our imaginaries, onto post it notes, which provided the flexibility to shift around ideas while shaping the game system.

App System Ideation

+ PLANET PLANT GAME




Greetings + Introduction Plant Ambassador
All Alone On This Planet, Build Your Own world
Complete Plant Related Survival Tasks, Transmit Plants From Real World to your Virtual Planet
USER CREATION
Detect Plant Information (Condition + Data + Plant Family + Symbiosis Data)
Plant's Functions Are Amplified On Your Planet, They Become Creature Alive
Flourish The Planet With A Variety Collection Of Plants
Online Community

Reflection

What didn't work out was that there are a lot of interaction design part that, because of us lacking experience, are have obstacles moving forward.

We also found that the functionality of the device could be improved. Rather than just letting it be a single purposed detector, it could be given more meaningful ways of usage.

What we learned from this iteration was that if we could increase the interaction with plants to not just finding them, but to actually get to know about them, just like the way we get to know a new friend, then it would really affect how people regard plants as.

Final Iteration
PLANTIVERSE

44

Our Goals

The goal of this project is to challenge and alter individuals' perspectives. The intention is not to promote any particular life choices such as the vegan lifestyle, the ongoing activism of zero-waste, or anti-consumerism. Instead, it is to encourage critical thinking and make subtle changes in daily life decisions. Subtlety greatly and easily helps people embrace new concepts.

With all the social and environmental awareness happening around the world, two different opinions emerge. There are the ones that are passionate and supportive, and the ones who are bothered and disagree. Other than holding different viewpoints, people may not fully understand the notion of being advocated or they feel that their original lifestyle is threatened. Plantiverse wants to bridge the gap. By avoiding bold statements and set obligations, Plantiverse approaches people in a more fun engaging and moderate manner. We guide people to build friendships with plants through the earlier ways : face-to-face communication, observing and reacting upon other's changes and behavior, and listening to their voices.

+ Mission & Vision

Mission:
To create a instrument that acts as a voice translator, friendship builder between plants & human

Vision:
Bring joy and bring insightful connections between plants & human

+ Qualities & Values

joy / harmony
sustainable / natural
intelligent / inspirative

Challenges

Yes. **LISTEN**

Plants have a "voice" to be listened to? How do you prove that the sound is authentic? These were questions we had to answer. Plantiverse is a system, as well as a design kit including three medias: product, branding materials, and an app. The value of the design kit is to enhance users' experience through different activities. We had 3 design concepts tied within the design kit: restoring the bond between human and plant, sustainability, and maintaining individual well being.

We find that the most efficient way to indicate plants are lively living creatures, is to project their "sound". We cannot make plants move on a more frequent and fast level like other creatures do. However, what we can do is to amplify what they do have in similar with us, which is a voices. The reason why human ears cannot hear plants, is because the radio is out of the human hearing range. In hence, designing a device that can project the sound and transfer it into hearable music was the critcal concept for Plantiverse.

How Might We Design a plant-centered system for human users to introspect their relationship with plant nature ?

Target Audience

20 ~ 45 years old
With an spirited and explorative mind eager seeking for the unknown knowledge in plant nature world. Through engaging with plants, teenagers and young adults are able to build up the realization that plants are important. The realization can help them decrease the seriousness of Plant Blindness.

Parents
Parents are the biggest potential buyers of plantiverse. They could regard plantiverse as an investment or an early-eduction for their children.

Spirited

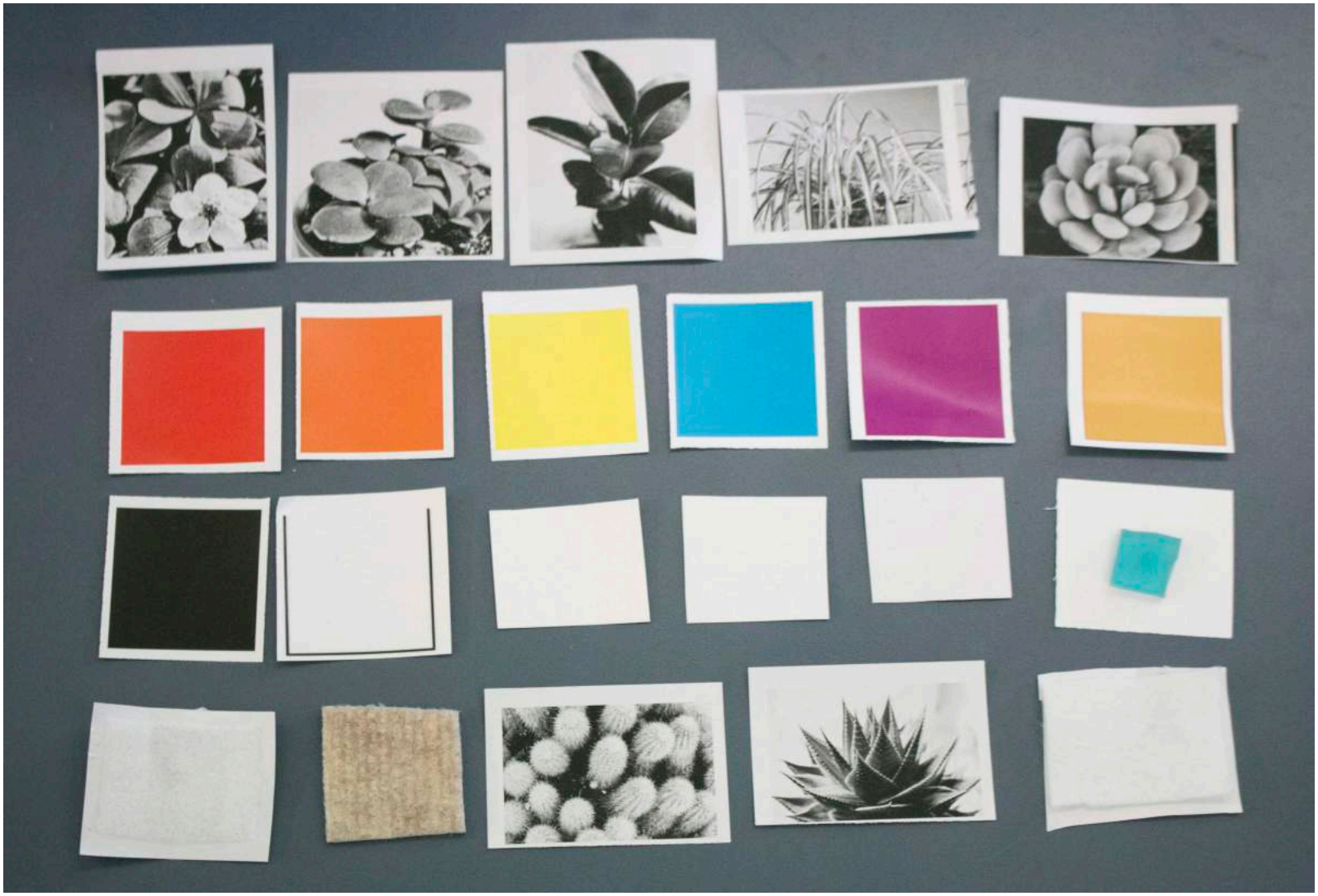
Explorative

Inquisitive

Primary Research

The purpose of this activity was to gather quantitative information from the people in Emily Carr University. The demographic in the university consists young adults that under age 30. Also includes instructors, technicians, staff members at age 30 to 50 and beyond. Therefore, the university was a great place for us to conduct the primary research experiment.

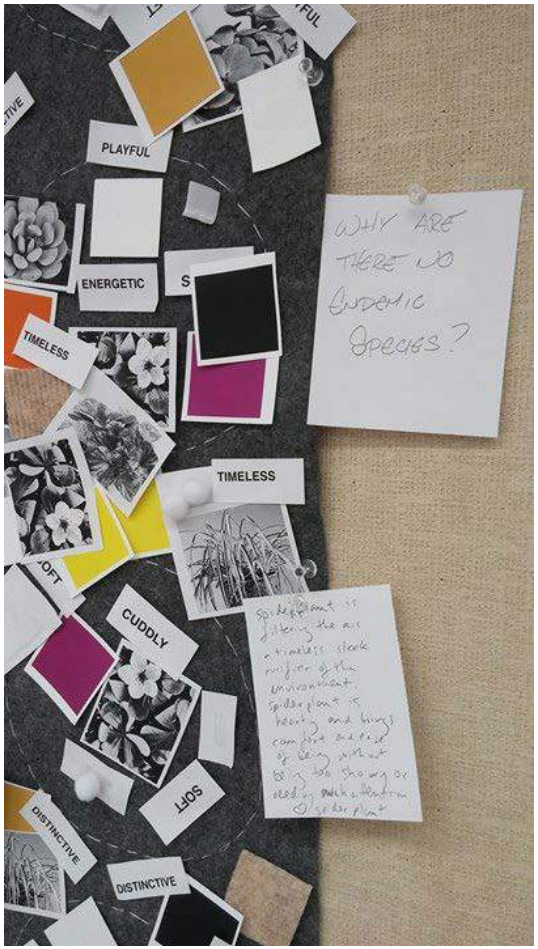
We placed a board at the university entrance, with visuals of different plants, colors, texts, and textures. Participants are to pick out a plant, and further select the related colors, textures and words accordingly to their subjective perspectives. Then they are asked to write a short description or story of what the combination means to them.



The selections
The plants were printed in black and white on purpose, to prevent participants from choosing their preferences in favors of color presentation.


4
3
2
2


CUDDLY

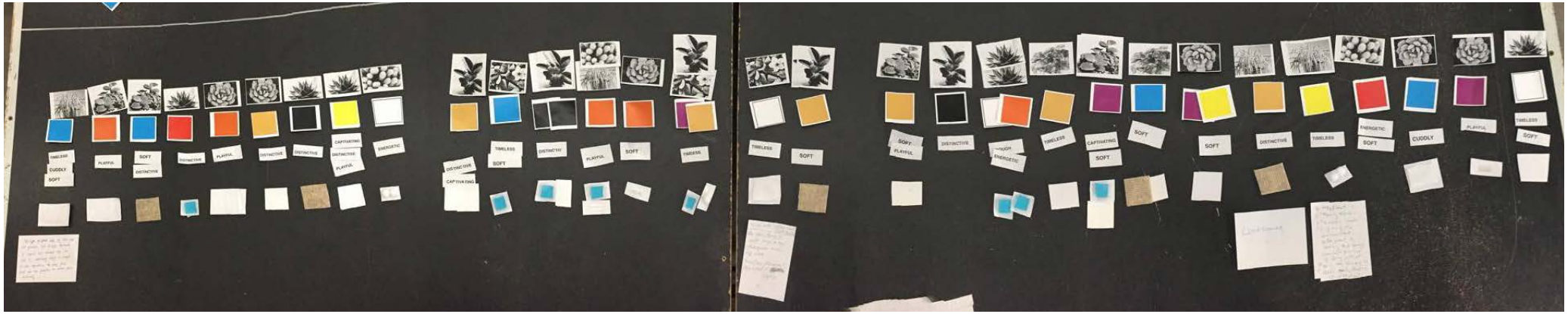

PLAYFUL
ENERGETIC
TIMELESS
WHY ARE THERE NO ENDEMIC SPECIES?
TIMELESS
CUDDLY
SOFT
DISTINCTIVE
DISTINCTIVE


DISTINCTIVE


CAPTIVATING
SOFT
TIMELESS

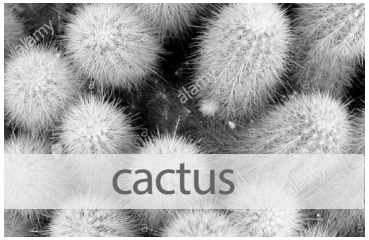

CUDDLY
CAPTIVATING
DISTINCTIVE
SOFT
TIMELESS
SOFT
ROUGH
ENERGETIC
TIMELESS
PLAYFUL
CUDDLY
CUDDLY
ROUGH
SOFT
ENERGETIC
ENERGETIC
PLAYFUL
ENERGETIC
SOFT
DISTINCTIVE
CAPTIVATING
SOFT
TIMELESS
SOFT

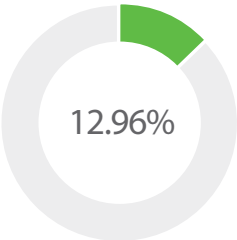

your thoughts

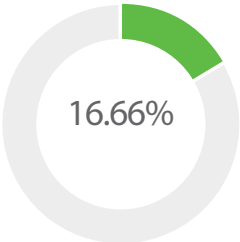


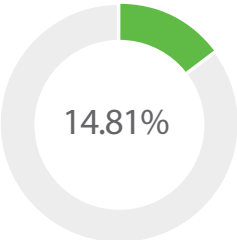
We spread out the response from each collected circle.

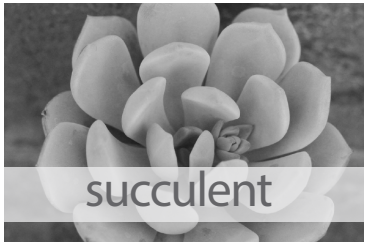
End Result

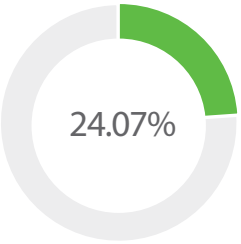


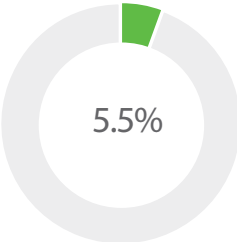


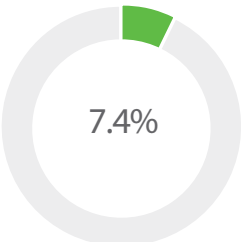


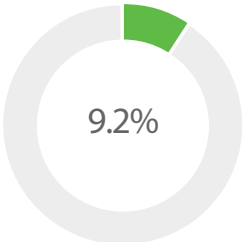


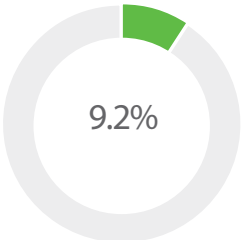




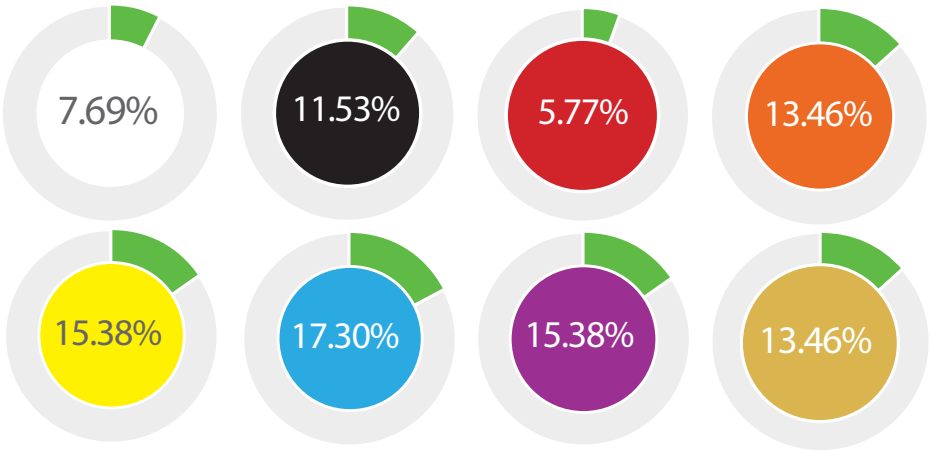




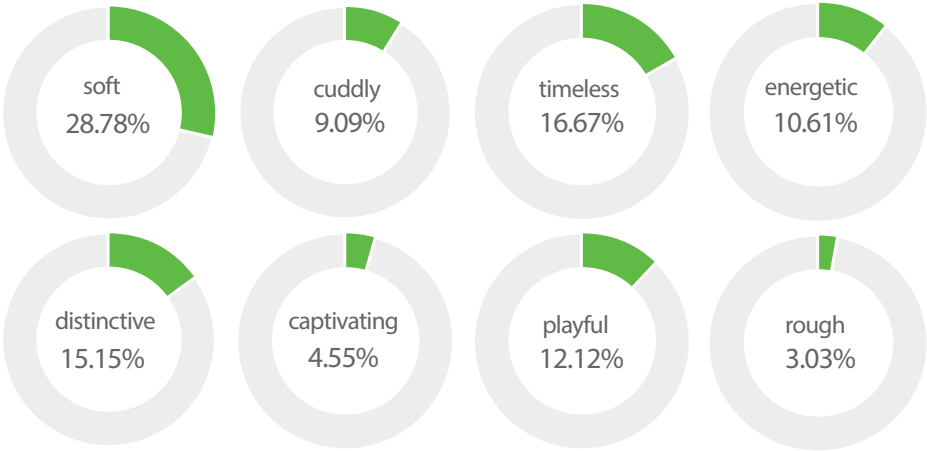




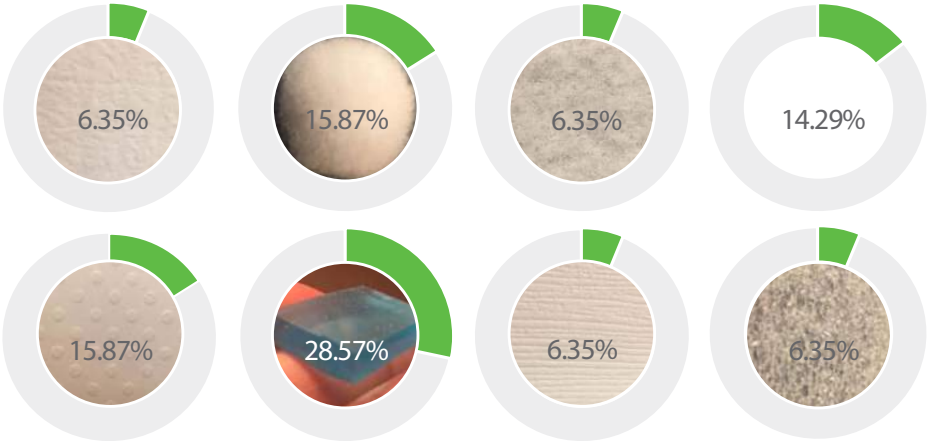
The collected information was interpreted and present in data visualization manner.



COLORS



ADJECTIVES



TEXTURES

Material Research

The ArboForm, also known as 'Liquid Wood', is the invention of two German scientists who were in the quest for a renewable plastic that has wood-like qualities but can be cast by a machine. Sceientists Juergen Pfitzer and Helmut Naegele in collaboration with Norbert Eisenreich, Wilhelm Eckl and Emilia Inone-Kauffmann, found that by combining natural fibres (flax, hemp or other fibre plants) and some natural additive, Lignin, a key ingredient in every piece of wood, can be "transformed" into a renewable plastic if it's mixed just the right way. This bio-plastic, which they named ArboForm, can be molded just like plastic via injection machines, is durable and forms super-precise when it's cast but also has the properties of wood – biodegradability, turning itself into water, humus and carbon dioxide.

Liquid Wood

Re-transformed Plastic Bags

The project is called Müll. It is a project about a new recycling process transforms plastic waste into high-end design objects.
It is formed with an indirect heat source as well as lots of consistent pressure. The colors and patterns are created solely from this special process, which involves heat, consistent pressure, and time. There are no colors added, dyes, or anything of the like.

Polyhydroxyalkanoate (PHA) Polyesters

For the polyhydroxyalkanoate (PHA) polyesters, the two main members of which are polyhydroxybutrate (PHB) and polyhydroxyvalerate (PHV). These biodegradable plastics closely resemble man-made polypropylene. While they're still less flexible than petroleum-based plastics, you'll find them in packaging, plastic films and injection-molded bottles.

PHAs biodegrade via composting; a PHB/PHV composite will almost completely break down within 20 days of cultivation by anaerobic digested sludge, the workhorse of biological treatment plants.

Polylactic acid (PLA) Polyesters

Polylactic acid, or PLA, is another aliphatic polyester and one that can be made from lactic acid, which is produced via starch fermentation during corn wet milling. Although most often generated from corn, PLA can be made from wheat or sugarcane as well.

PLA boasts the rigidity to replace polystyrene and PET, but it has an edge over the real thing: It decomposes within 47 days in an industrial composting site, won't emit toxic fumes when burned and manufacturing them uses 20 to 50 percent less fossil fuels than petroleum-based plastic. Often, companies blend PLA with starch to reduce cost and increase its biodegradability.

Early Design

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Dissemination

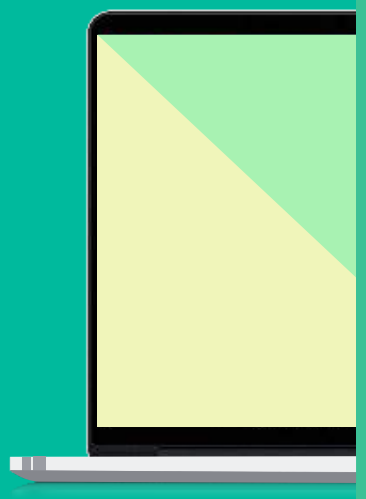
The whole system shall be widely accessible to general public. The system aims as a educational tool. From pre-order service to post-product service, the entire process shall be thorough and considerate. The monitoring device itself shall be straight forward to use.

Our system consists the product device itself, print materials such as user guidebook and takeaway campaign flyers. An app that enhance the user experience. And a campaign video guiding users how to use the system also advocating the concept of Plant Blindness.

project sounds

user guidebook
& campaign

app collection



Find us on
our campaign
website and
posters /
advertisments in
public

You will receive
a package that
includes the
monitor device,
a how-to-use
guidebook and
campaign materials

Download our app,
sync the monitor
device to your
mobile device app,
and set up your
account

Start exploring
the possibilities
! Make new
friends !

Join the
community,
Join the hype
the vibe !
Become
environmental
conscious !

Product Design

KEY DESIGN CRITERIA

Functional

+ the amplifier be able to detect the plants electrical waves and transfer into sounds
+ the sensors are able to be attached onto the plants properly
+ the amplifier shall be portable

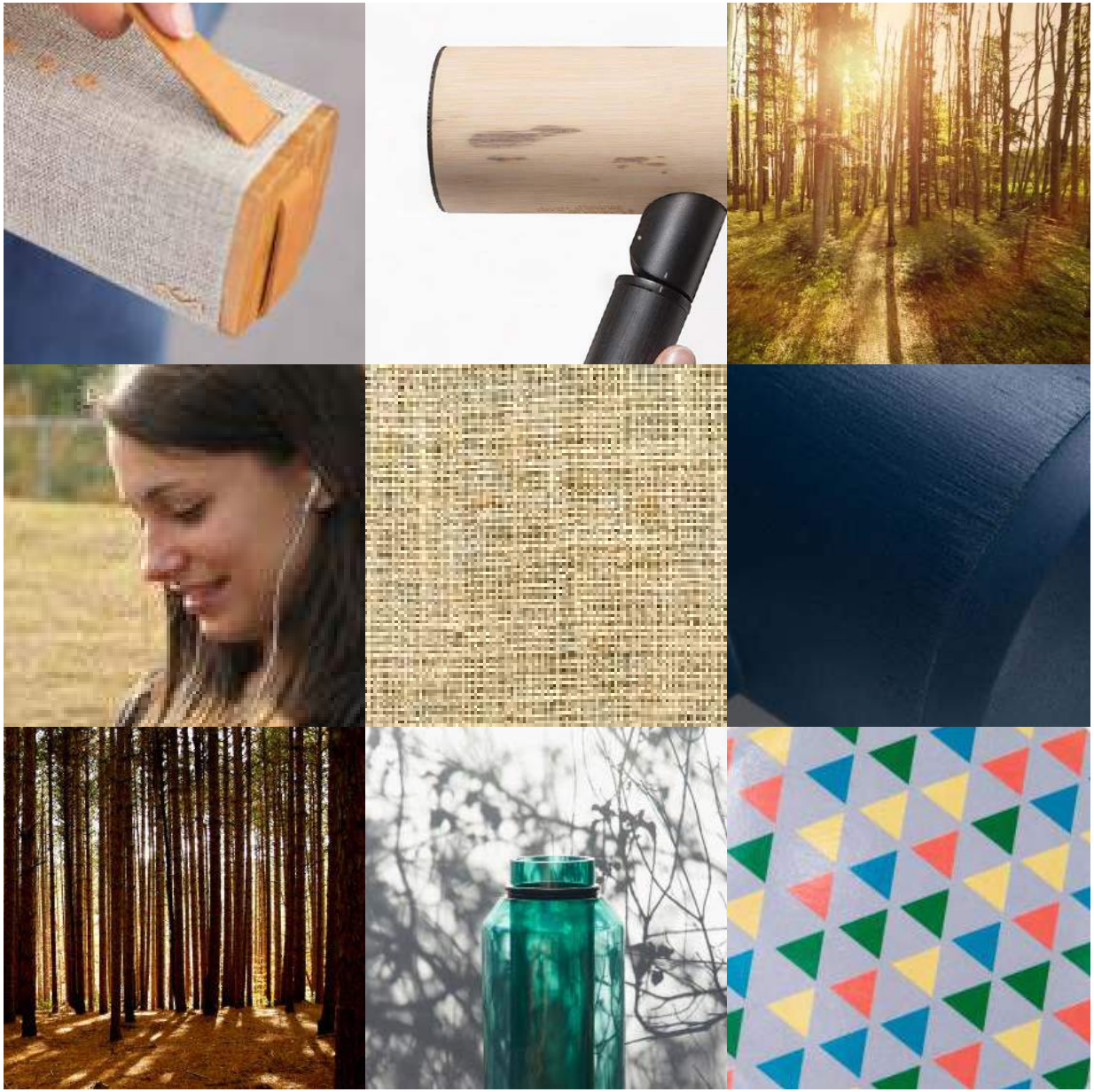
Experiential

+ the housing of the amplifier is easy to handle
+ allow users to carry around and organize sensors with ease

Emotive

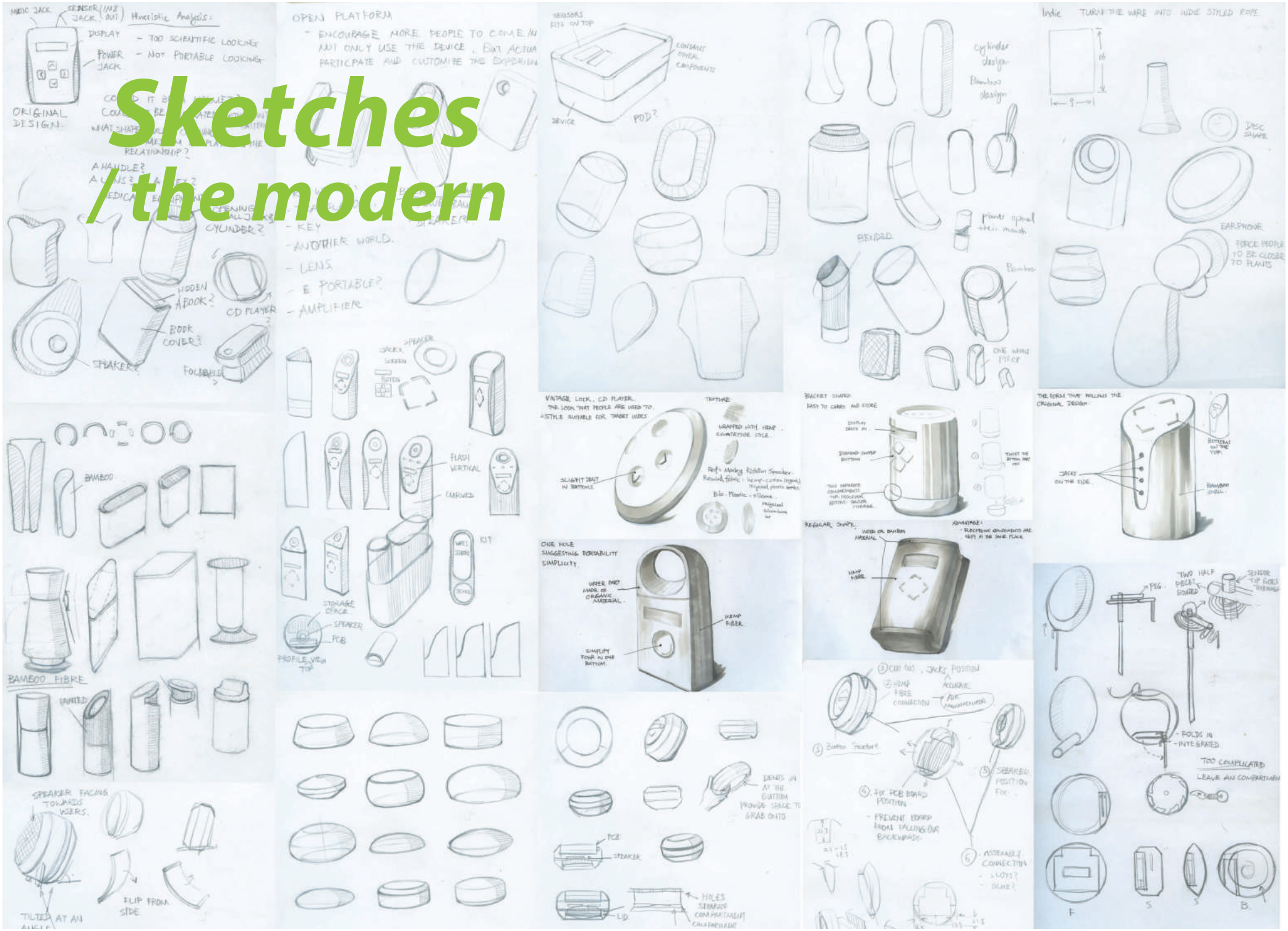
+ the material selection of the housing suggest the sound is from the plants themselves

Visual Board



organic
portability
ergonomic form
blend in environment

Sketches / the modern



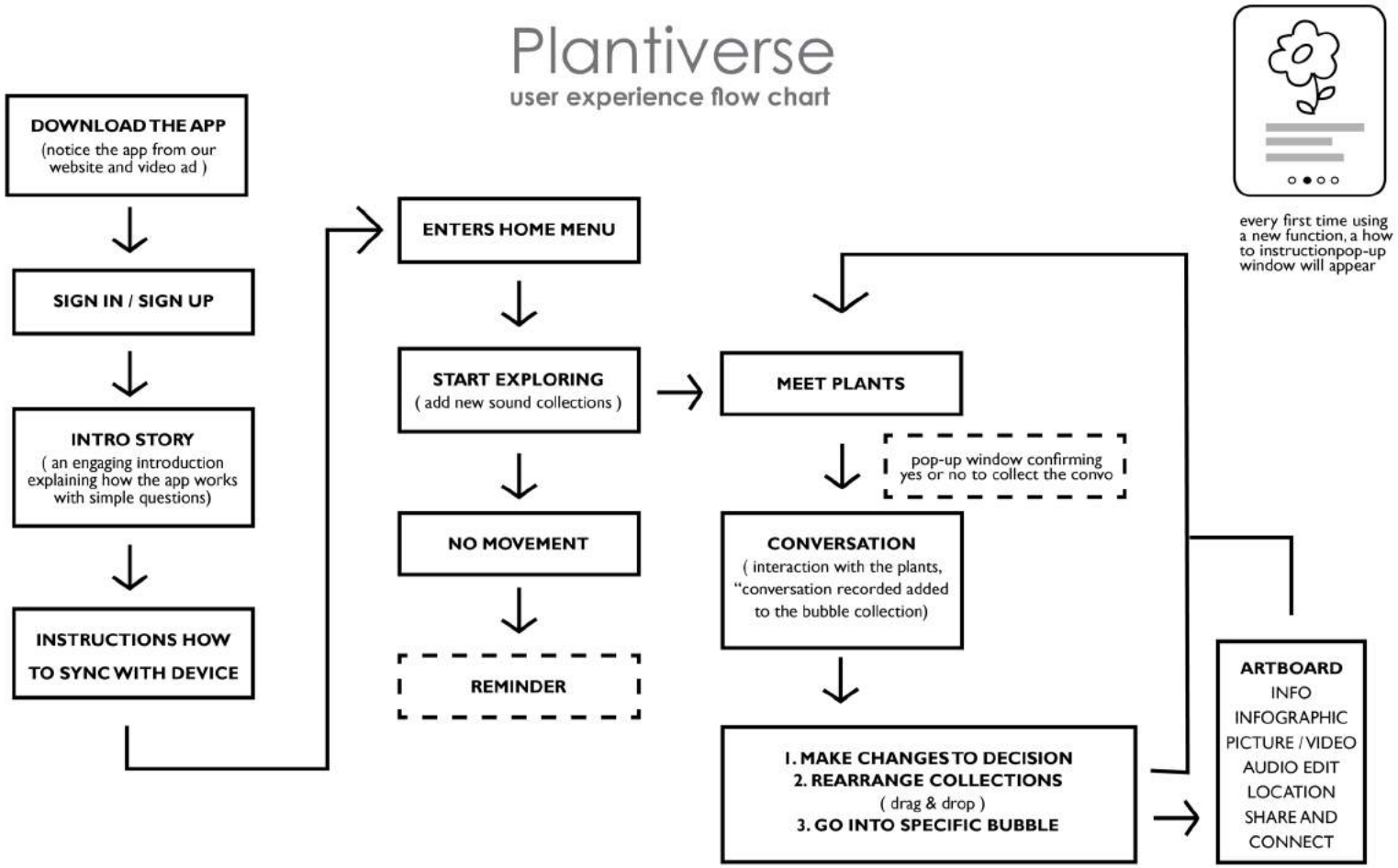
Sketches
/ the futuristic

IDEATION SKETCHES

APP GUI Design

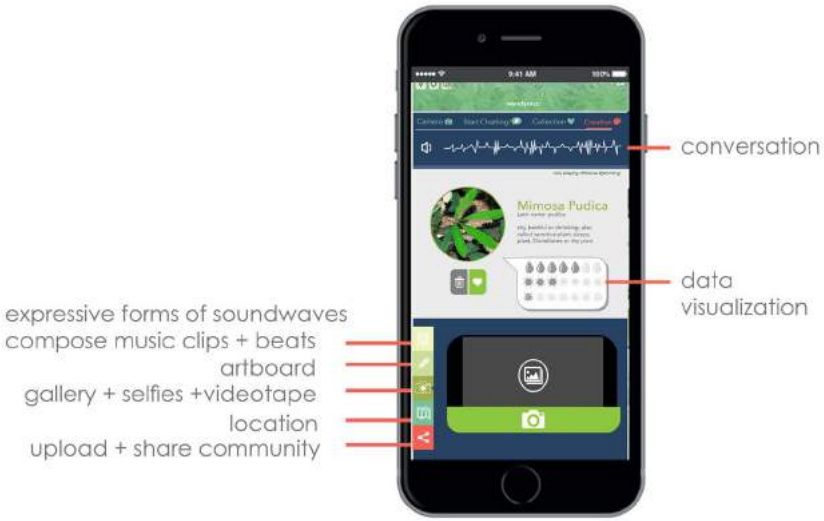
The purpose of the app is to make the whole user experience more thorough and complete. The app is where users collect memories. It's like Instagram or Messenger, it stores user's meaningful diaglogues between you and your plant friends.

INITIAL USER FLOWCHART



Initial Rough Interface

landing page



Design Refinement

71

Collaborator

We were very lucky to collaborate with the international plant awarness company, Music Of The Plants. They have been working on advocating plant perception for a long time. They've developed a device that uses MIDI to transform the impedance from a leaf to the root system of a plant into music.
As quoted from their official website, "Extensive research continues today as we become conscious of the innate ability of nature to communicate with us when we have the instrument to listen". After researching and Skype meeting the cofounders, we realized that their initiatives were very much similar to our project notion. Therefore, we approached them, and they were very generous to provide us their inner core technology, so that we can focus on what we are good at -- designing. Gratitudes to Music Of The Plants for assisting us making our intangible design ideas into a practical, functional device.

http://www.musicoftheplants.com/en/

Music Of The Plants
Plant Instrument

Product Prototype / the Modern

PURPOSE OF RESEARCH

The purpose of this research is to obtain the user validation of the ergonomics and aethetics for plantiverse, which includeds the shape of the device and placement of the buttons. The intention is to create the most acceptable design that could be handled by the most people, and with the appearance that is intriguing to the targeting group.

TESTING INTENTIONS

The ergonomics driven testings include: the initial cardboard model survey, the foam model survey and the buttons placement testing.
The aesthetics driven testings include: the material testing and the informal survey.

1 CARDBOARD MODEL SURVEY

Qualitative research conducted for overall impression on the device shape according to the participants personal understanding about plantiverse. After receiving the acutal electronic components, eight general forms of the device are made. Participants were asked to choose the one which they felt to be most appropriate for interaction between human and plants. They were asked to make selection twice, one before they hold on to the model and one after. Each set of the shapes were documented by photograph.

1 RESULT

The first round of selection results are: no.3 (3 times), no.4 (3 times), no.1 (2 times), no.2 (2 time), no. 5 (2 time)
The disc shape no. 4 was picked 5 out of 12 times. For the second round (after touch). The other choices that are also picked included: the no.5 (3 times), no. 6 (3 time), no. 2 (1 time).

It is interesting to see how people's visual judgement is very different from their opinions after physically experience. The no. 4 (disc shape) was selected for further design and development.

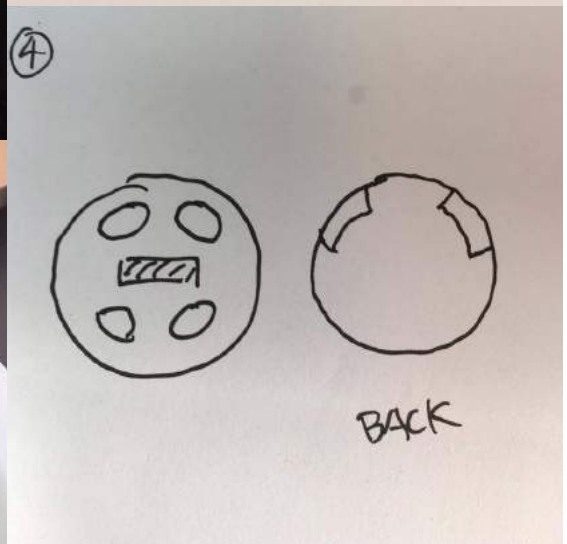
2 USER TRIAL

More foam prototypes were developed following the results from the previous survey. The 12 participants are all adults, which two of them are over 40 years old, two are at their 30's, and the other 8 participants are in between age of 20 to 28.

The user trials took place at different places for participants convenience, which includeds school classrooms, home and starbucks cafe. The participants were introduced the basics of the project, and the entire activity process was guided through by reseacher.

2 ACTIVITY: FORM TESTING

The users are given 12 different foam models. By hold on to them, the users are asked to pick their favorite one, and explain the reason of their selection, reason they chose not to pick the others, and what they would prefer to change based on their choice. Then the participants were asked to draw out their preferable placement of the buttons, and explanin the reasons.



2 ACTIVITY: RESULT

The results mainly covered 4 different models: 1, 6, 5, 10, which are all cylinderal shapes. Only one participant picked the box shape, and out of the rest of the 11 participants, 7 of them picked either no. 6 or no. 1.

This is an unexpected result for me, because my personal favorite was no. 5. The most common feedback was that they prefer the shape with a certain thickness, which allows them to hold on with ease and wouldn't need to worry out slipping out of hands.

The result of the participants button placements varies, but similar designs included: buttons around the monitor, dial switch and dials on the side.

A user trial of model with similar material is underway.

3 USER TRIAL

After the final prototype was made, a third user trial was applied to gather a last round of suggestions for refinements.

This last user trial happens in school. The participants are 16 students with different height, gender, weight and hand sizes from industrial design major. They are interviewed individually. After played around with plantiverse, they are asked to provide opinions regarding material choices, size, shape, etc.

3 ACTIVITY: RESULTS

Terms That Are Mentioned The Most

Weight 10
Fillet 12
Button Shape 2
Button Material 9
Button Height 13
Power Button 2
Material Transition 1
Hemp Dirt 6
Upside Down 1
Speaker Soft Cover 2

3 ACTIVITY: CONCLUSION

Weight
It was brought up multiple times that the weight could be heavier. According to participants suggestions, by adding suitable amount of weight, it could improve the experience especially when handling.

Button
It has been suggested that the button height could be lowered, as right now it is relatively too high for the fingers to hover over the surface. Also some fillet could be added to the buttons for softer pressing.

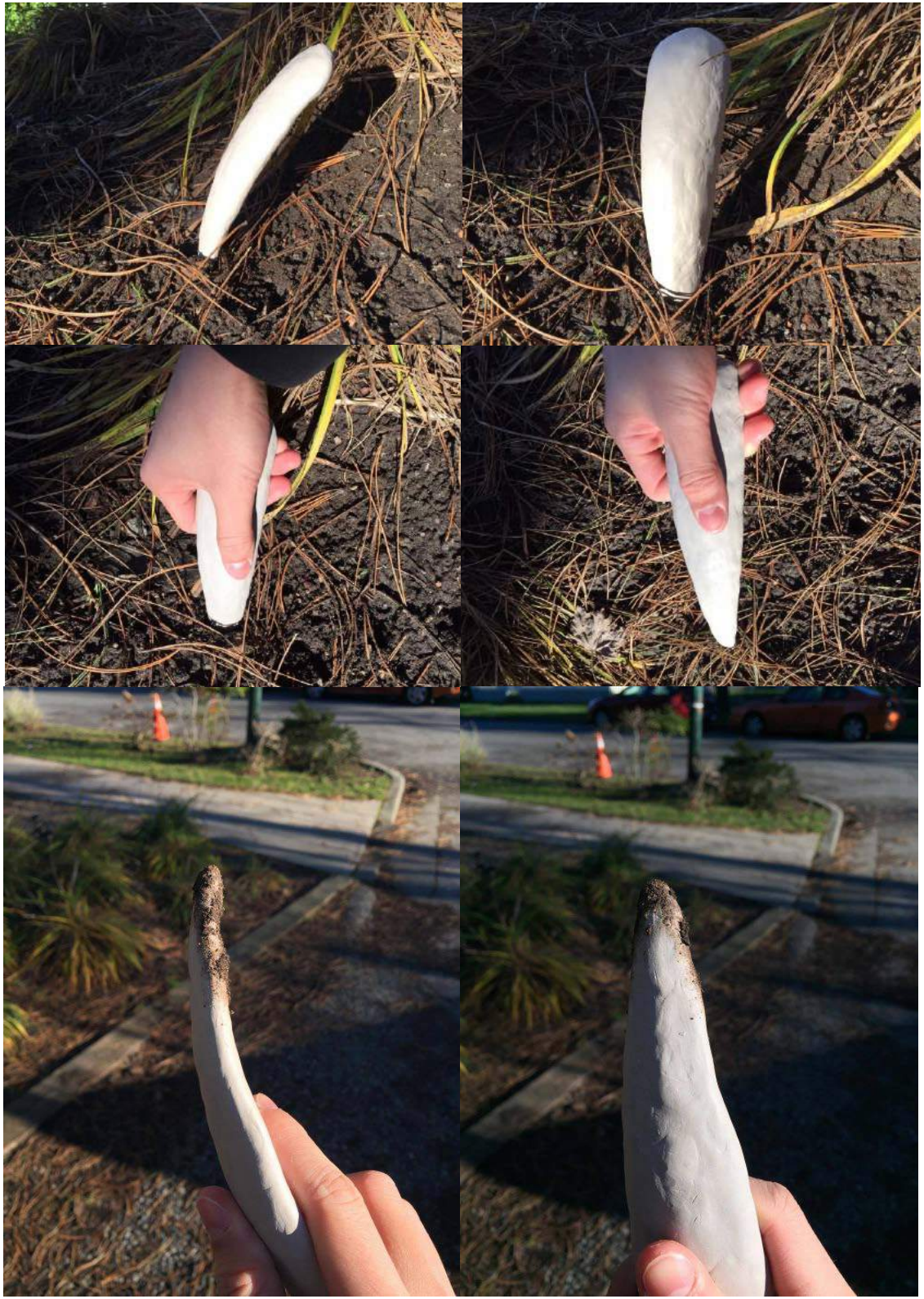
Material
Most comments on the material selection are positive. The bamboo matches with the hemp. There are concerns about the hemp gets dirty easily. Some participants are suggesting to remove the hemp, while the rest of them prefer to have the on. Especially with one of the participant appears trypophobia against the pure bamboo back with holes.

Shape
The feedbacks toward the shape are overall good. The power button could be moved more towards the side.

Product Prototype / the Futuristic

FORM EXPLORATION

To achieve a plant-like, organic form was our goal. We used clay to explore different shapes. We held the shapes in hand to do ergonomic testing.



TESTING No.1

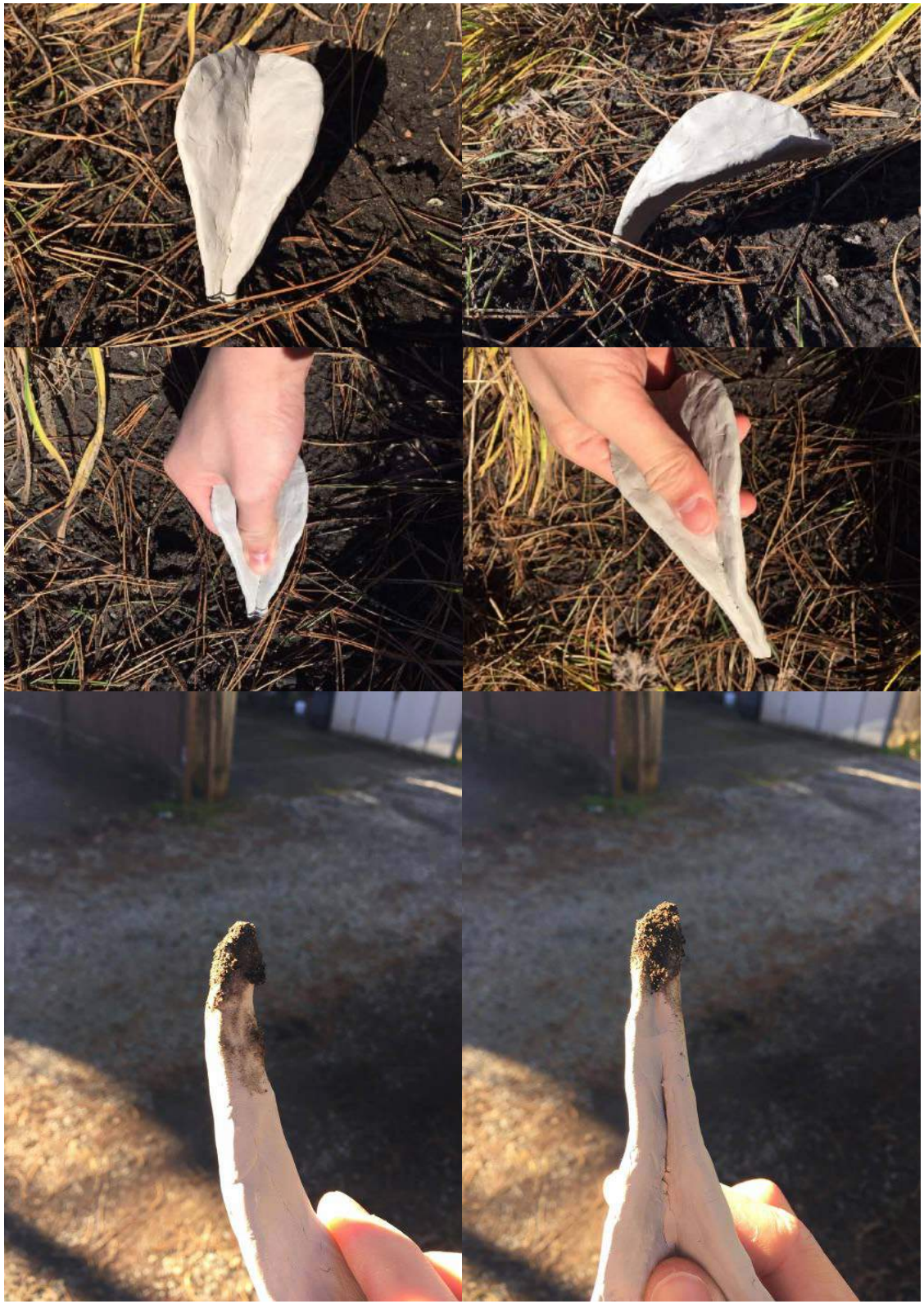
Pros
enough handle part, provides good grib
straight, pointy end, easy to insert

Cons
slightly over-sized, lacking portability
curve degree isn't ergonomic

TESTING No.2

Pros
the branches form an interesting ergonomic form
straight, pointy end, easy to insert into soil

Cons
the body has little material to grib onto
size is too small



TESTING No.3

Pros
good ergonomic form, provides extra space to grib
straight, pointy end, easy to insert

Cons
head has some amount of dirt left because of the dent

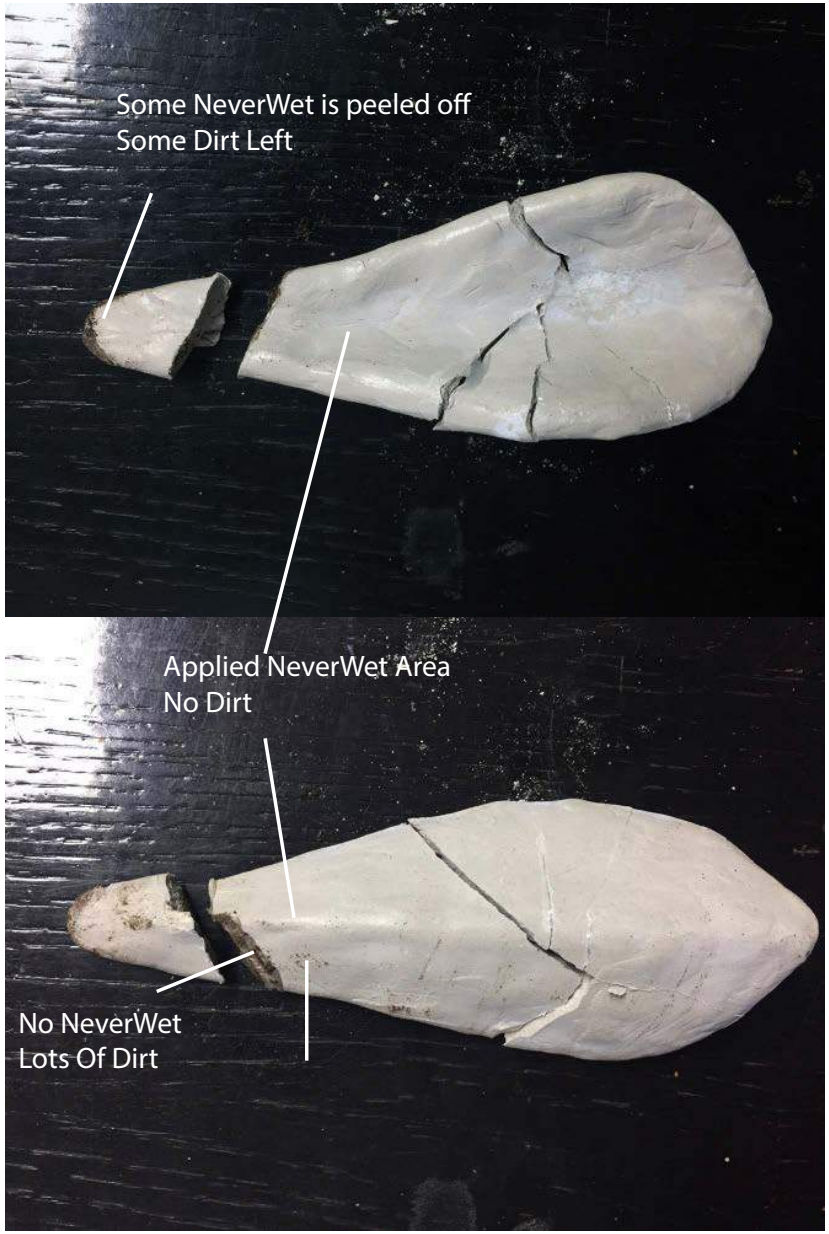
TESTING No.4

Pros
good ergonomic form, provides extra space to grib
straight, pointy end, easy to insert

Cons
head has some amount of dirt left because of the dent

Surface Treatment testing NeverWet spray

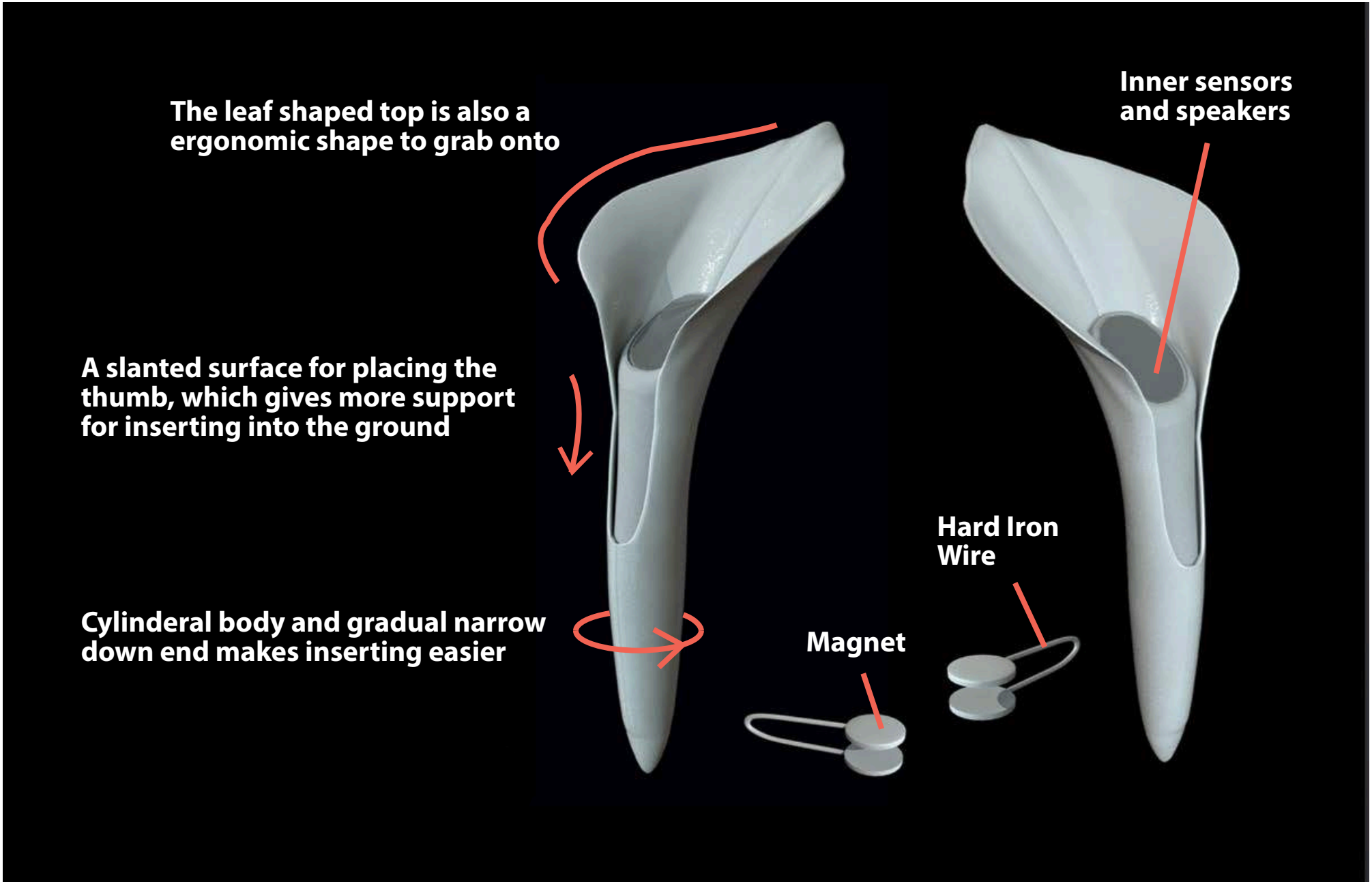
NeverWet is a layer of hydrophobic coating that completely repels liquid. We applied NeverWet for testing its dirt resistence. They are gel-based and can be easily applied either by dipping the object into the gel or via aerosol spray. In contrast, the oxide polystyrene composites are more durable than the gel-based coatings, however the process of applying the coating is much more involved and costly. Carbon nano-tubes are also expensive and difficult to produce with current technology. Thus, the silica-based gels remain the most economically viable option at present.

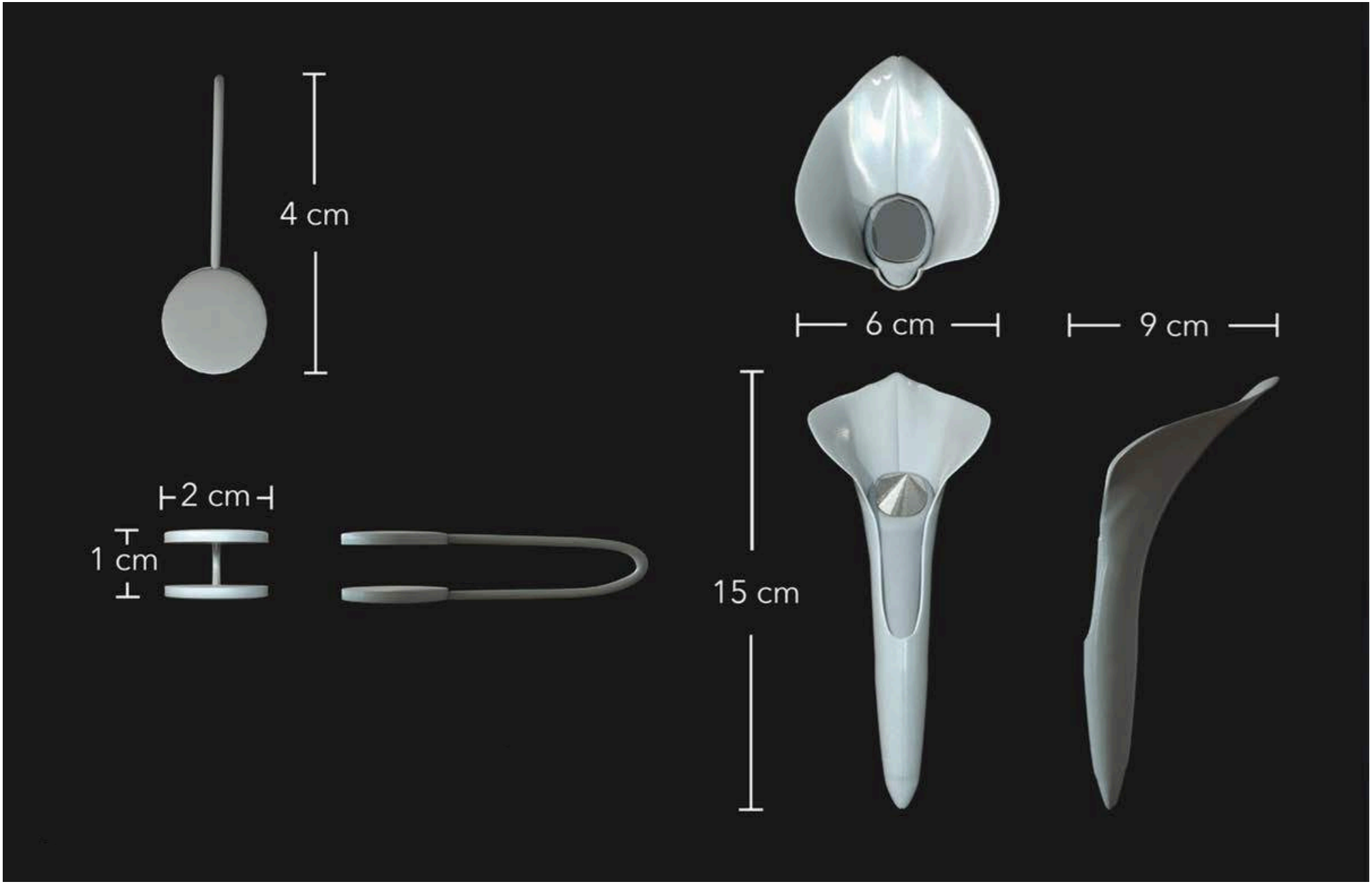


The preferred, most rigid shape and ergonomic choice

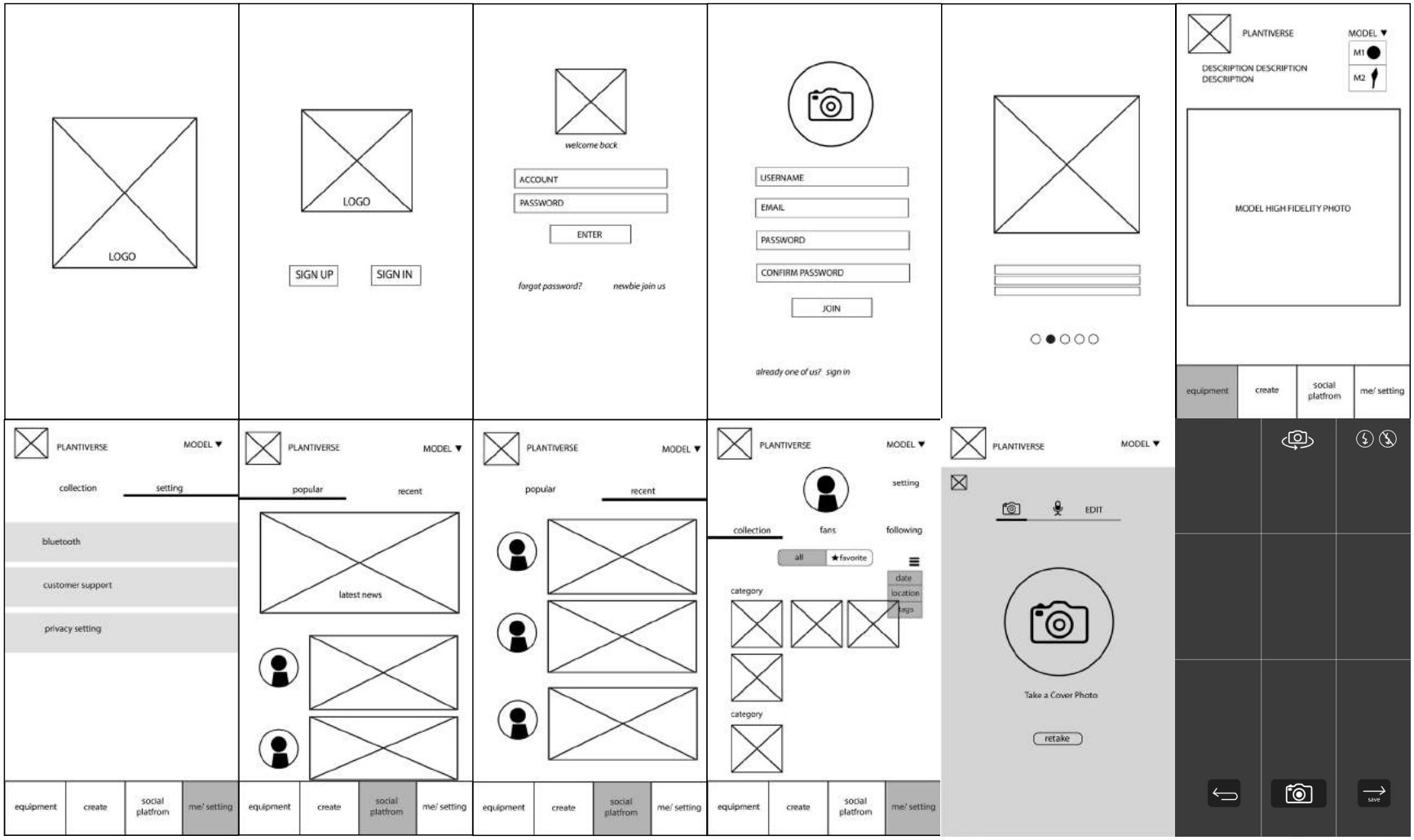
We finalize the form of both the body part and the clip part. The finalizations are done on the tracing paper, and take in consideration of not only the appearance, but also the ergonomics of the object.

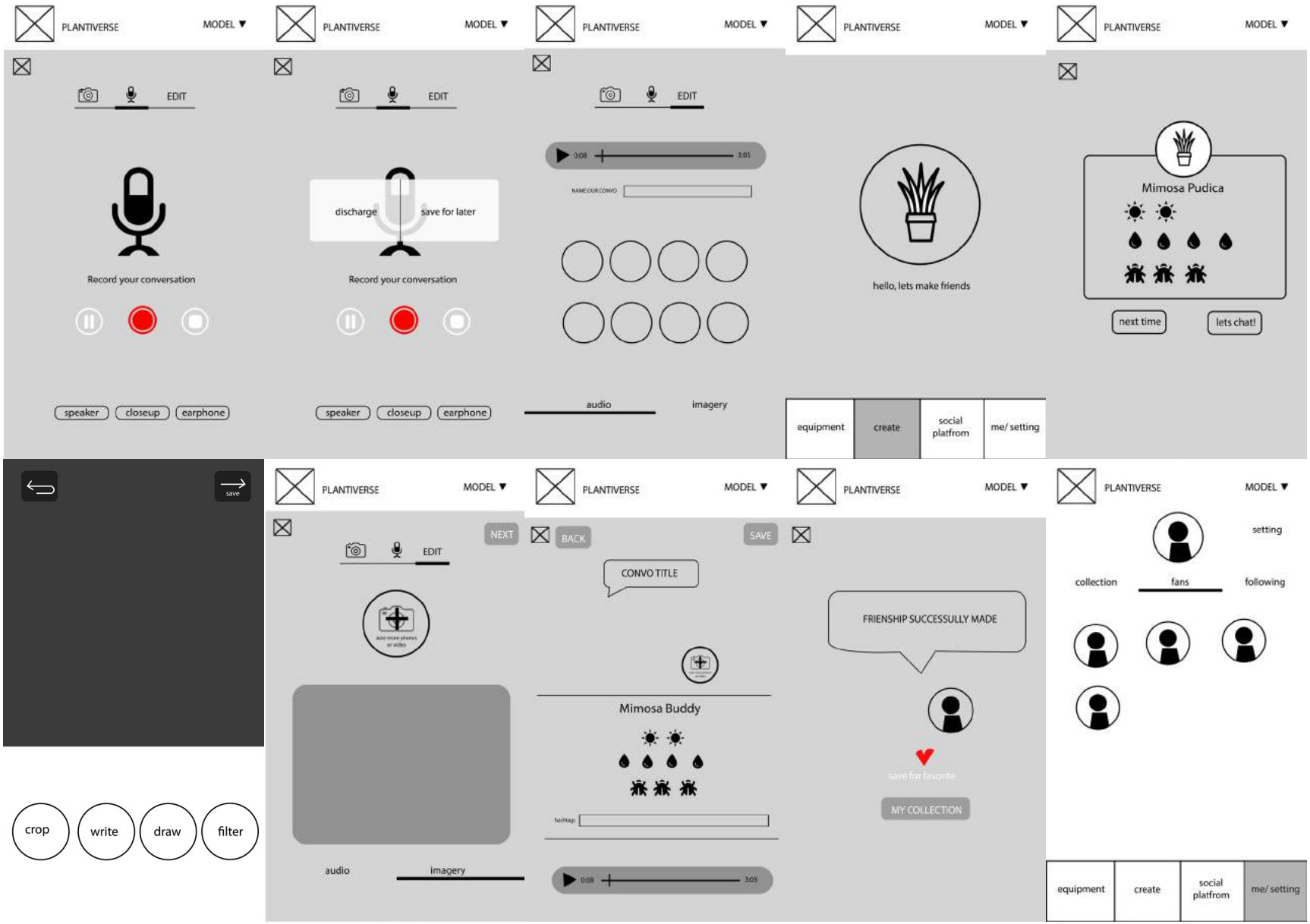
The final decision is that the body part will be the leaf-like form as circled in red. As for the clip will be the first one that is color shaded on the right.


The leaf shaped top is also a ergonomic shape to grab onto
Inner sensors and speakers
A slanted surface for placing the thumb, which gives more support for inserting into the ground
Hard Iron Wire
Cylinderal body and gradual narrow down end makes inserting easier
Magnet


4 cm
6 cm
9 cm
2 cm
1 cm
15 cm

APP Wireframe

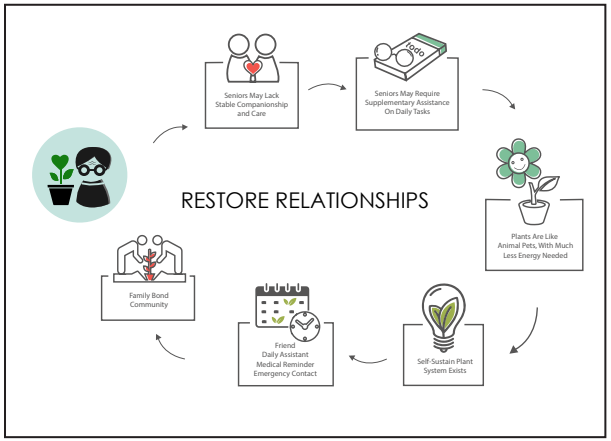


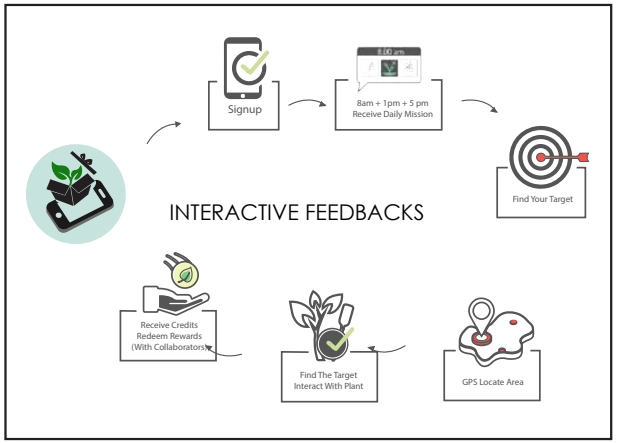

PLANTIVERSE
MODEL ▼
EDIT
Record your conversation
speaker
closeup
earphone
discharge
save for later
audio
imagery
NAME OUR CONVO
hello, lets make friends
equipment
create
social platfrom
me/ setting
Mimosa Pudica
next time
lets chat!
save
crop
write
draw
filter
NEXT
BACK
SAVE
CONVO TITLE
Mimosa Buddy
hashtag
FRIENSHIP SUCCESSULLY MADE
save for favorite
MY COLLECTION
setting
collection
fans
following

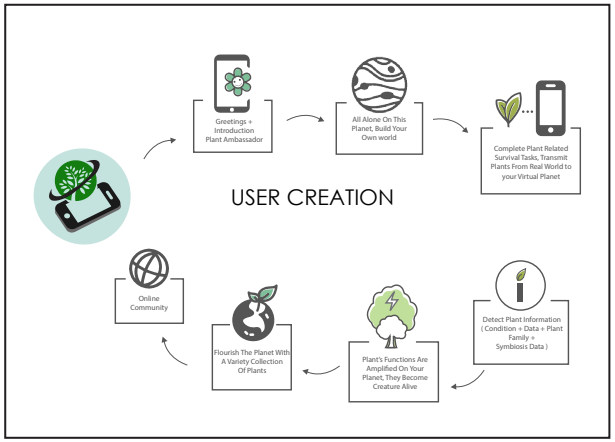
Print Design

ALL SYSTEM MAPPING

Mapping out all the previous research and design systems, were helpful because we are able to see clear paths of our concept developments. Icons made it more efficient to quickly grasp the idea of each system, and pull out the important points in order to move on to next design stages.







PLANTIVERSE

plant
plenty
diverse
universe

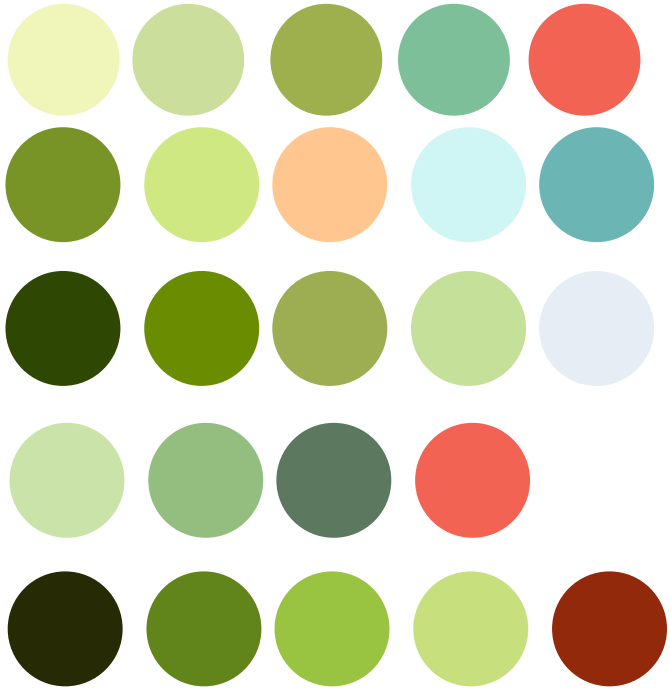
+

leaf veins . roots . soil
friendship . connection . develop

The evolution of our brand name

Print Design

the chosen



PLANTIVERSE

playful but sophisticated
explorative and discover
connection to diversity

PLANTIVERSE

{ playful but sophisticated
explorative and discover
connection to diversity }

Brand Identity
LOGO EVOLUTION

rembrace
playful
sophisticated
explorative
discover
connection
diversity

PLANTiVERSE

PLANTiVERSE

Let the Plants talk.

Let the Plants talk.

Brand Identity
LOGO EVOLUTION

PLANTIVERSE

PLANTIVERSE

PLANTIVERSE

PLANTIVERSE

PLANTIVERSE

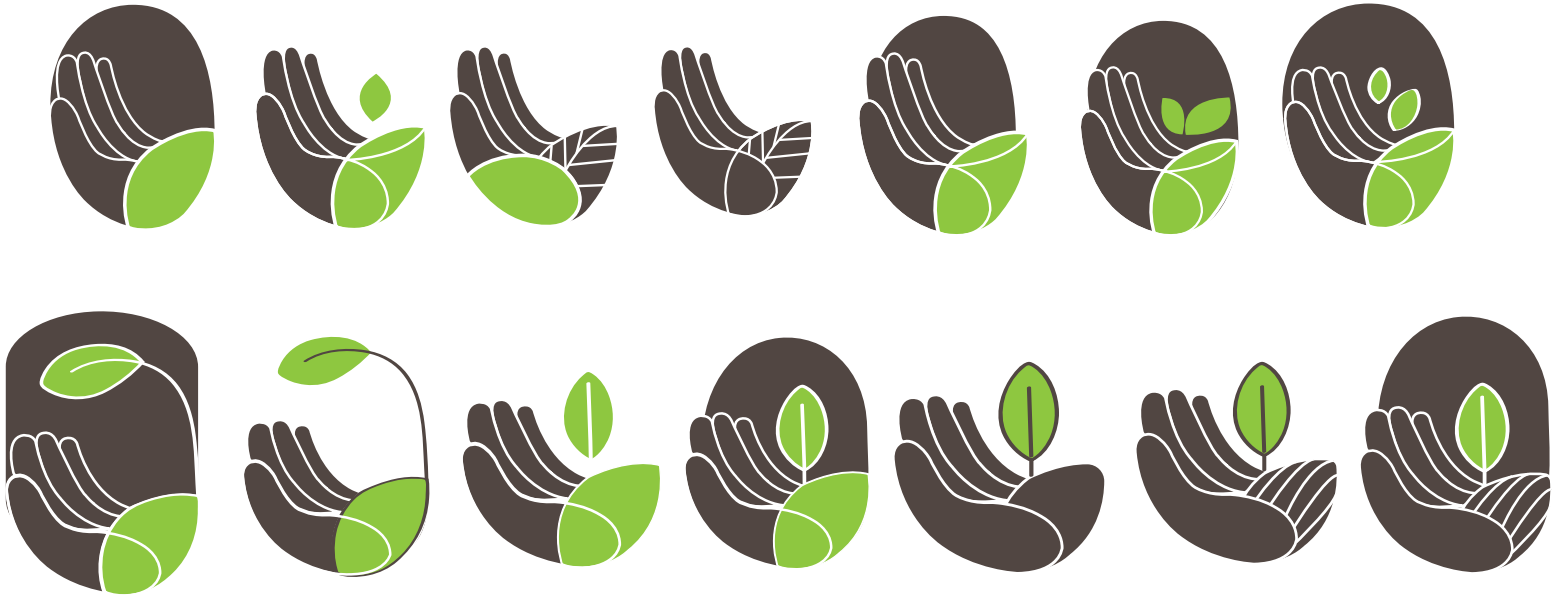
PLANTIVERSE

PLANTIVERSE

PLANTIVERSE

PLANTIVERSE

Brand Identity
LOGO EVOLUTION



Final Logo

PLANTIVERSE

PLANTIVERSE

Listen to the Plants

Visuals

embracing + roundness
+ nature friendship

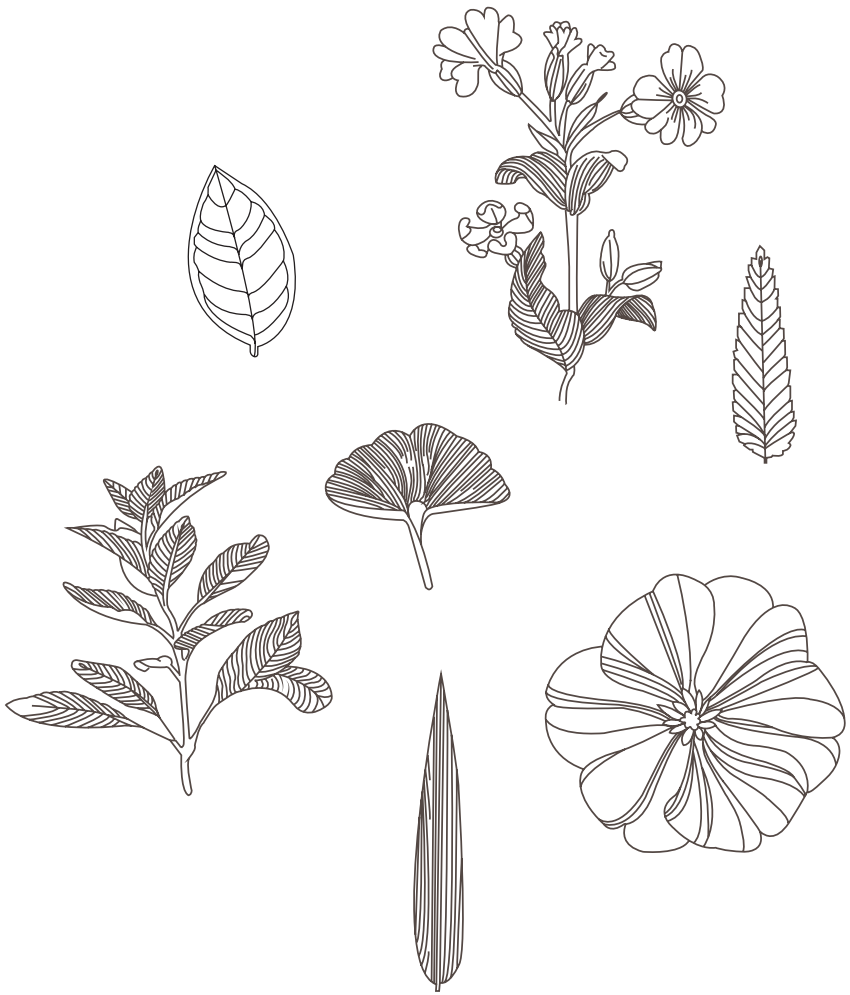
to be interpreted from different perspective

unfolding + unraveling the underlying

simple soild colors with accent of

line drawings

subtlety and versatile



Visuals
/ APP ICONS /

embracing + roundness
+ nature friendship

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unfolding + unraveling the underlying

simple soild colors with accent of
line drawings

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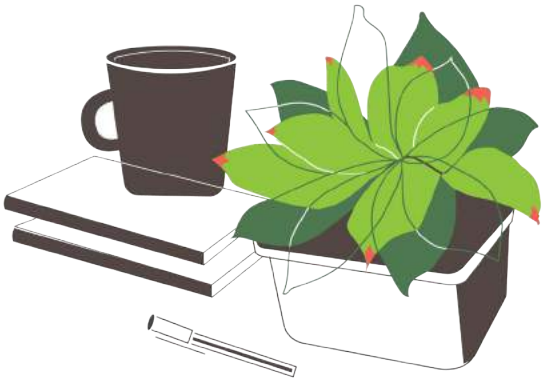
Visuals
/ CAMPAIGN ICONS /



Final Outcome

The System


bluetooth sync between
device and phone app
artsboard allows users to
edit the images and recordings
find a plant friend
detect the species &
recieve invitation
share user experience
& collection via social platform
record the melody
with phone app
start off the conversation
by capturing a cover photo
insert the ground sensor into
soil & clip the clip sensor onto
the leaves. moist the leaves
and the plant shall start
playing melody

Product Design/ the Modern

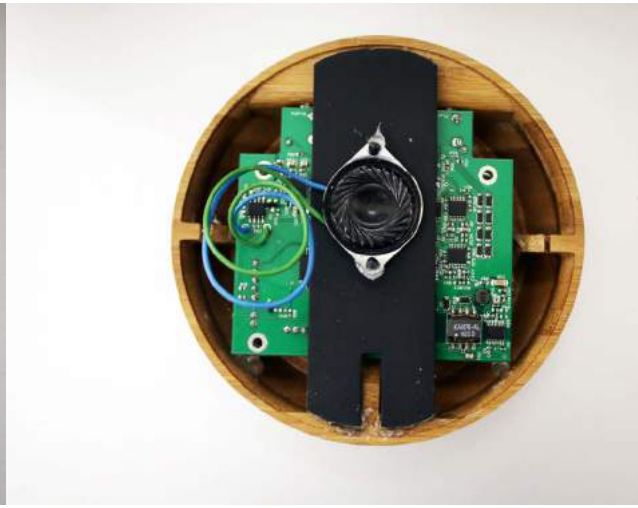
SUSTAINABILITY IN DESIGN

Bamboo was selected for the device housing material because it is light, calming, and inviting. Bamboo has start to rise to become the more innovative alternative for wood. Surprisingly, bamboo has strong rigidity in a relatively thin thickness. Bamboo also gives more control over its pattern and structure. Comparing two materials under the same thickness, bamboo is less easy to crack and it is also more enduring in moisture conditions. This characteristic is the perfect fit for our device, since the device needs to be portable and handy. The device speaker is protected with hemp fiber, allowing sounds to come through easily.

AESTHETIC

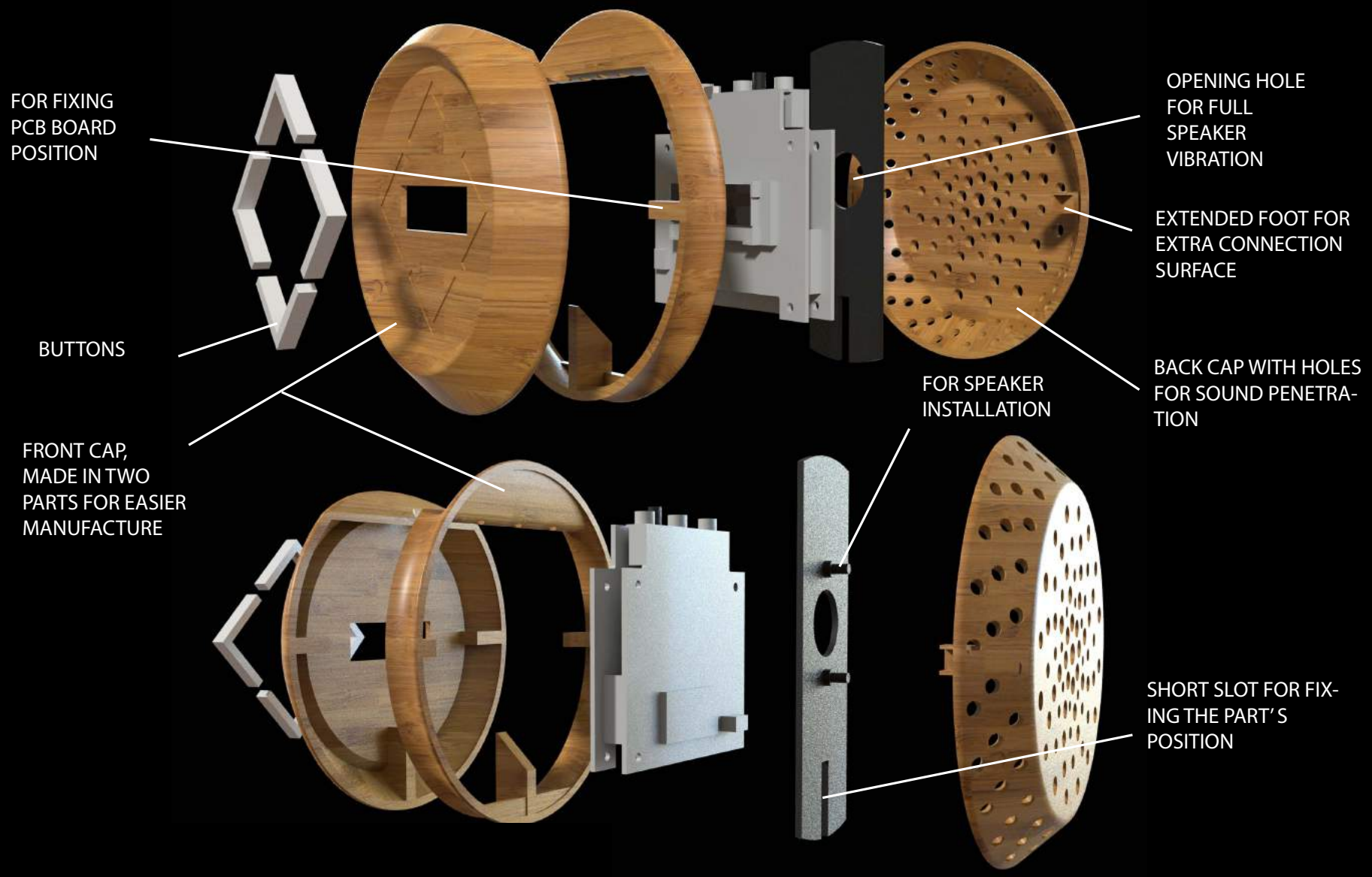
Plantiverse needs to be gender neutral and appealing to a wide age range. The combination of bamboo and hemp fiber conveys a purified style.¬The appearance design shall be timeless and appropriate for either children or adults. Plantiverse wants users to feel stylish even when they're out exploring in the mud and field. The combination in between high end technology products and hipster movement style. Ergonomic was a crucial consideration throughout the designing process. A series of prototype testing was taken place. Foam and cardboard prototype were used to observe how target users handle the device, their most comfort position and how the navigation buttons should be placed. The device shape and size should be suitable for handling using one or both hands.

bamboo
degradable plastic
hemp fiber



user friendly circular shape

sustainable material, bamboo & hemp fabric


FOR FIXING PCB BOARD POSITION
OPENING HOLE FOR FULL SPEAKER VIBRATION
EXTENDED FOOT FOR EXTRA CONNECTION SURFACE
BUTTONS
BACK CAP WITH HOLES FOR SOUND PENETRA-TION
FOR SPEAKER INSTALLATION
FRONT CAP, MADE IN TWO PARTS FOR EASIER MANUFACTURE
SHORT SLOT FOR FIX-ING THE PART' S POSITION

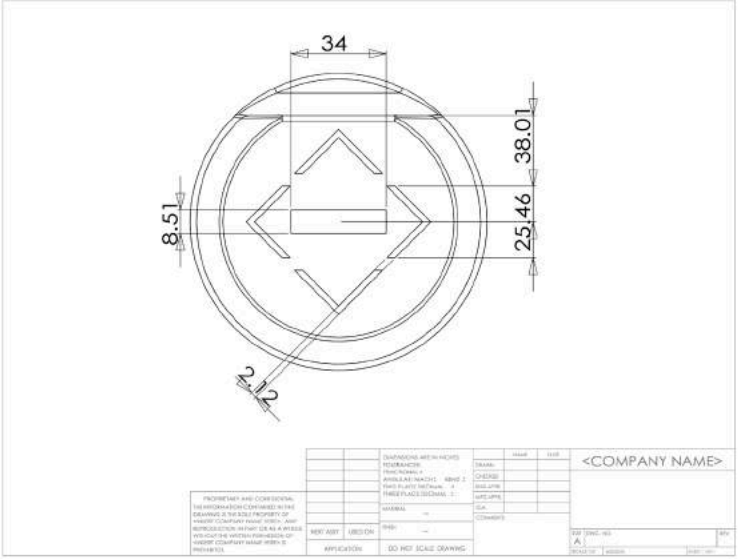
Measurements

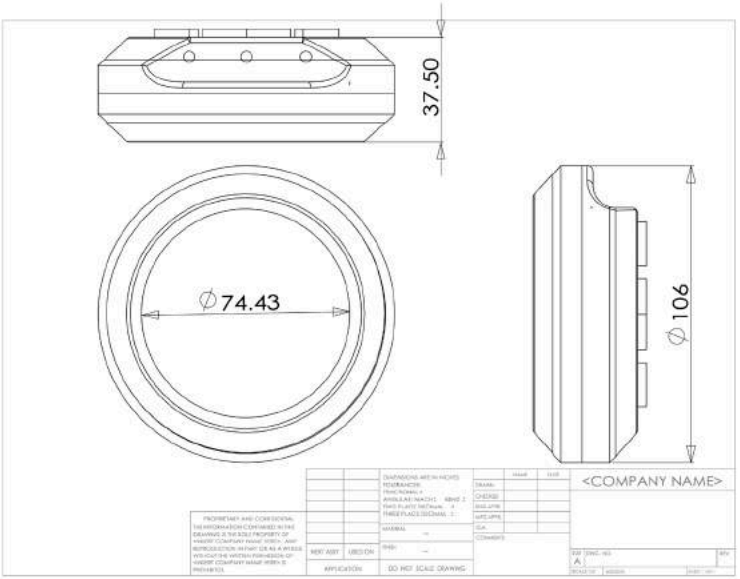
The amplifier part 1 and 4 will be covered with a layer of hemp fibre on top of the cover the parts themselves, which are made of bamboo. The buttoms on the part 1 will be made of bio-degradable plastic.

The amplifier part 2 and 3 will be made of bamboo.

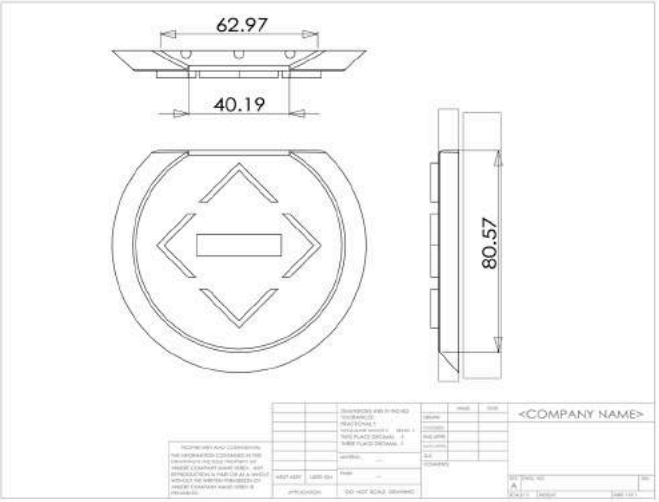
Overall Size

Unit: mm

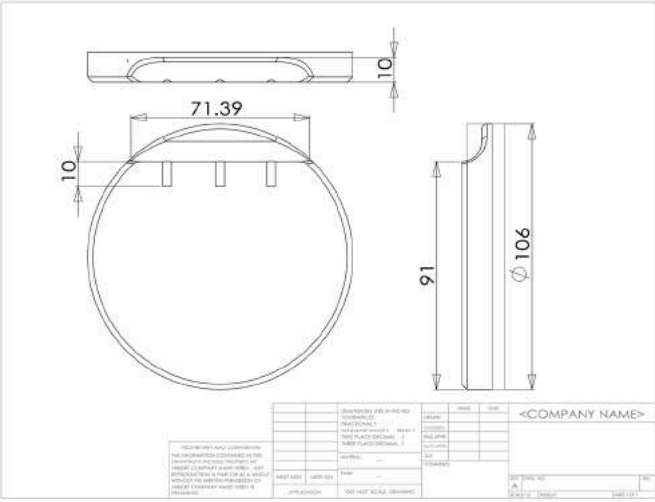




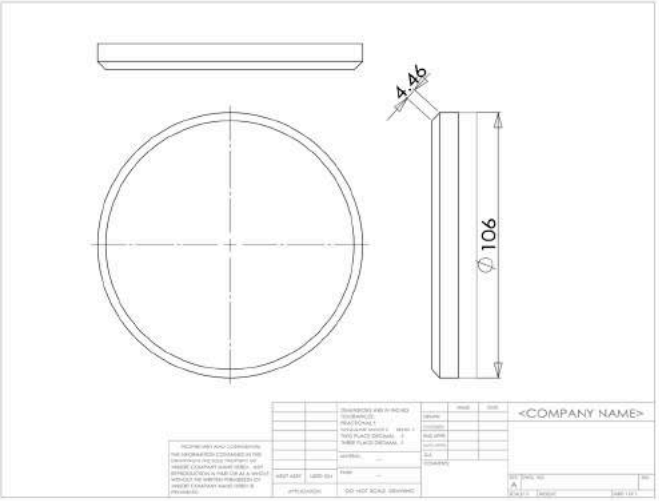
Part Size Unit: mm



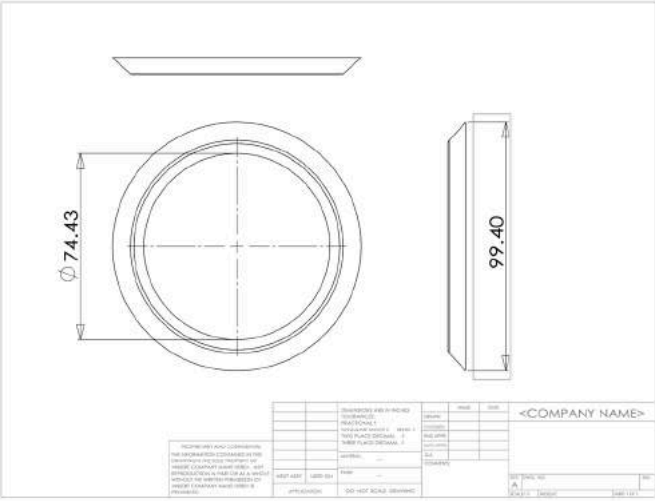
Part 1



Part 2



Part 3



Part 4

PACK

With every pack of plantiverse, it comes with an amplifier, a ground sensor, a clip sensor, a charger and a hemp bag.

endurant
earthy nature tone
sustainable aesthetic
minimalistic material

INDOOR

FLOWERS

CLOSEUP

TREES/BUSHES

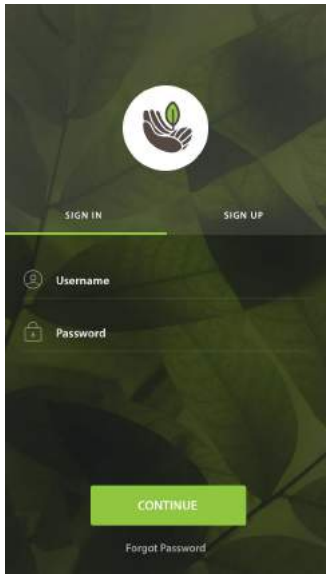
GRASS


PLANTIVERSE

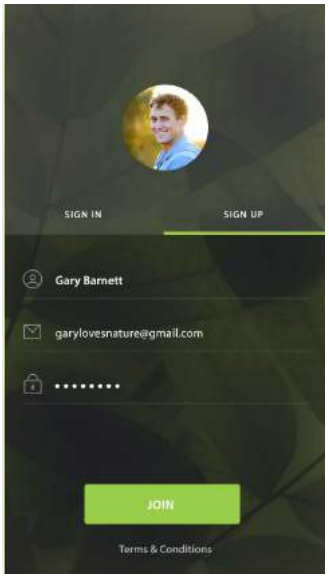

PLANTIVERSE


PLANTIVERSE

APP



sign in



sign up

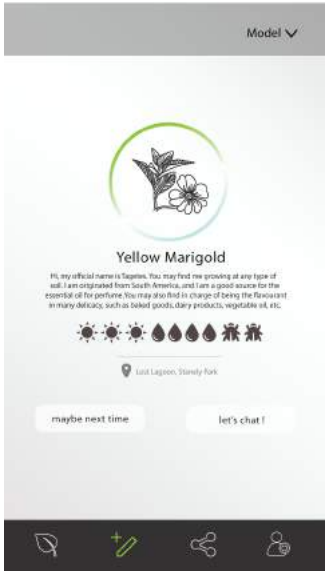
intro

outdoors

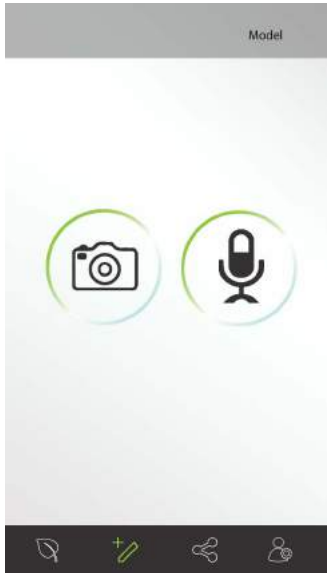
indoors

how-to

pick a model

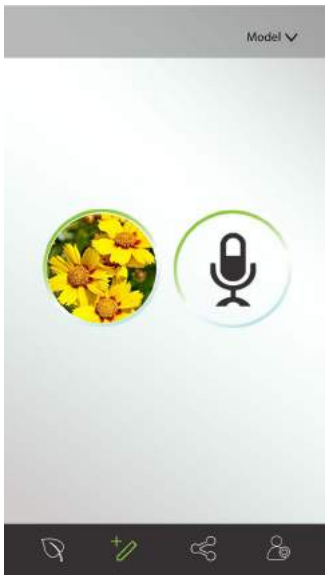


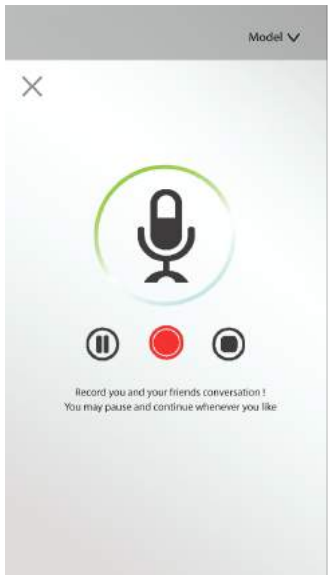
greeting from the plant
+ plant's information



action

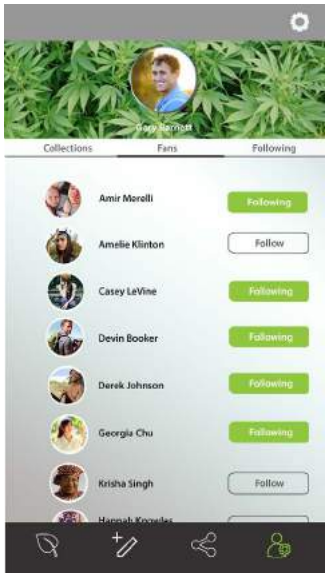
capture + edit cover photo

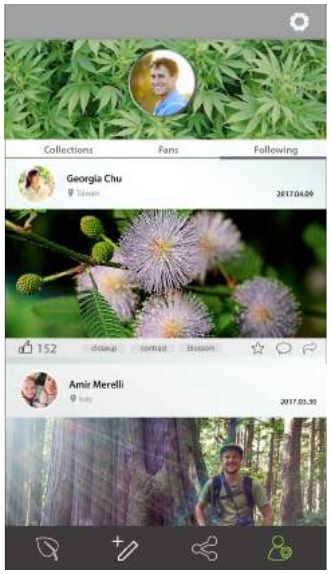


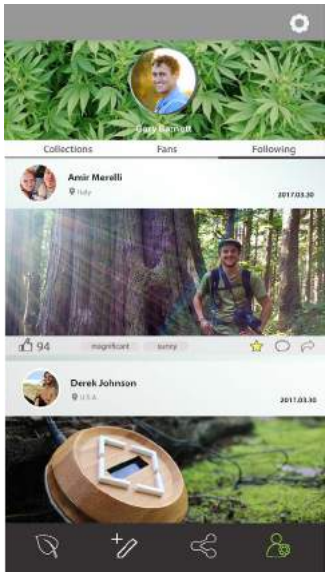


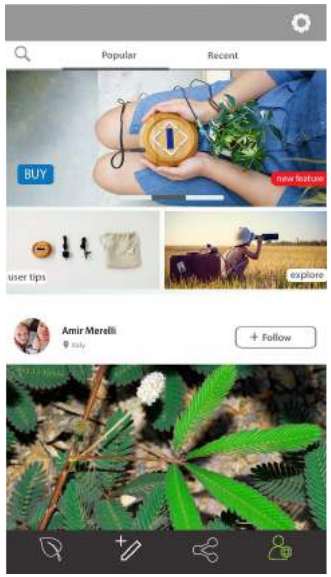
record

edit recording









my collection

fans

news feed + social platform

User Guidebook

The visual language of Plantiverse is simple with accents of elegant line drawings. Five vivid color elements represent the various greens, flowers, and vegetables. Pure colors derived from hemp fiber and bamboo were also emphasized. Due to the fact that (since) plants having a voice is still a fairly new concept to the majority, is was essential that our design kit not only provides instructions on how to utilize the system, but also to function as a campaign. The campaign needs to inform users the possibilities and authenticity of plant intelligence. In that sense, we designed contemporary illustrated infographics to help users to digest the immense data in an understandable and approachable manner.

PLANTIVERSE

user guidebook

Listen to the Plants.

Underground is where the magic happens.

What is Plantiverse?

Plantiverse, is your tool for discovering the mysterious plant world. It introduces you to the beauty of plants' awareness and plants' consciousness. Not many people know that plants have a language of their own. But they indeed do. The output sound emitted by their electrical changes, are beyond the hearable sound range for our human ears. Without sounds and noticeable movements, plants are easily to be ignored and underappreciated. As technology advances, resources become more and more conveinent to acquire, and we tend to forget to protect nor cherish our natural resources. Since the majority regard plants as mute and immobile furniture, society has developed difficulties to cope in harmony with our environment. In fact, there is a professional term used for describing such symptom so called, Plant Blindness. Plant Blindness refers to the inability of noticing plants in one's own environment, the inability to recognize the importance of plants in the biosphere and in human affairs. Hence, we hope that Plantiverse can bridge the gap between you and plant nature. By exploring your surrounding, we hope you will realize that every single plant is an unique individual living being. They are conscious, they form communities and allies of their own, they have personalities, and they interact with its environment. And that includes US! They are just as keen to tell you how they feel when you stroke upon their leaves, or when you poke sticks into the ground soil, or when you accidentally step on them, and etc. Plantiverse will give you a whole new insight of your perception towards plants. It is no longer only about sunshine, water, and nutrition level, but beyond and making new friends.

We are excited that you are now part of our growing community dedicated to exploring the intelligence of the plant world. You now have the possibility to expand your awareness by discovering an unique and deep connection to the natural world around you. We invite you to share your experience with others! Please read this user guidebook carefully, and you may go off into the field wild and adventurous!

special thanks

Special thanks to The Music Of The Plants and SOLERA Opertational Manufacturer for providing the core technology and for making those imaginary ideas become tangible and valuable information for everyone to share.

general usage

The device, Plantiverse has been designed to control a MIDI synthesizer through the measuring of the electrical resistance of vegetable tissues. As described in the relevant section, the device must be connected to a plant or a tree using the appropriate clips (electrodes) supplied with the device. The model Plantiverse of the device can be connected directly to pre-amplified speakers, or to an external MIDI synthesizer.

BEFORE USING THE DEVICE, PLEASE READ ALL THE INSTRUCTIONS TO ENSURE ITS SECURITY AND CORRECT USAGE !

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BEFORE USING THE DEVICE, PLEASE READ ALL THE INSTRUCTIONS TO ENSURE ITS SECURITY AND CORRECT USAGE !

Warranty

Our general conditions of the device are made known to the clients when they purchase our product. We cannot be held responsible for physical or material damages if any of the following occurs:

- Use of the device not in compliance with the specifications of the User Manual and Maintenance
- Incorrect starting, use or maintenance of the device.
- Failure to follow our advice regarding transportation, installation, assembly, star-up, use or maintenance of the device and its accessories as stated in the User Manual
- The device has been modified without previous consent from the manufacturer
- Failure to perform a regular check-up of the parts connecting to the power supply
- The device has been repaired by unauthorized personnel
- The device has been connected to a power supply not in compliance with safety standards
- Influence of external factors due to force majeure

Copyright

Safety

CLEANING

Use an air spray or clean cloth specifically for electronic equipment. Pay careful attention not to scratch or damage the device. Before cleaning, remove the connection to the electricity and do not use any liquid detergents or aerosols. Use a damp cloth instead.

ACCESSORIES

Do not use any accessories not recommended by the manufacturer as they may cause damage and glitch.

WATER & HUMIDITY

Do not use the device near water, for example near a bathtub, sink , humid location, swimming pool or such.

EMBEDDED OBJECTS & LIQUIDS

Do not introduce objects of any type to the inside of the device through the openings, as these can come into contact with areas subject to an electrical current and can short circuit the components, which can lead to fires and electrical shocks. Do not spill liquids of any type on the device.

Inside your package

Before starting, please confirm that your package contains all t he necessary components as listed below.

Music Device

Campaign Postcards

Plant Input Wire (with clip and insert)

Plug Adapter

* the plug adapter varies for your country *

Learn the Basics

A Navigation Buttons
Made out by bio-degradable plastic, the device has four buttons for the setting of various parameters:
UP / scroll Up next menu
DOWN / scroll down previous menu
LEFT / select left or smaller value
RIGHT / select right or higher value.

B Display Monitor
To display the menu and status options

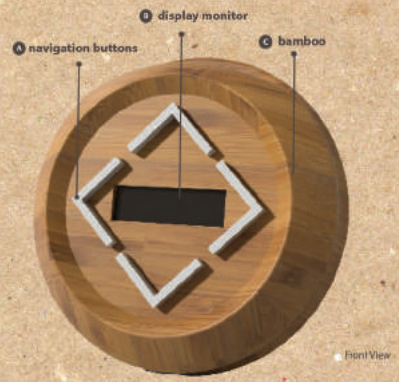
C **Device hardcore**
The amplifier part is made out of bamboo.

D External Speaker Connection
You may connect an external speaker. When the external speaker is connected, the internal speaker is turnt off.

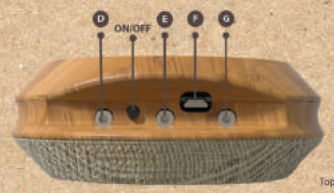
E MIDI Out
connection to external MIDI synthesizer

F USB Connection (two functions):
- For recharging of the internal battery. Connect the USB- charging adapter
- For an external control with a computer, it controls and record data. Connect an USB cable, which connects the device to your computer. For this communication you need a special program installed on your computer.

G Plant- Input
3,5 mm stereo jack socket for the cable, which connects the elektrodes to the plant



Front View



Top View

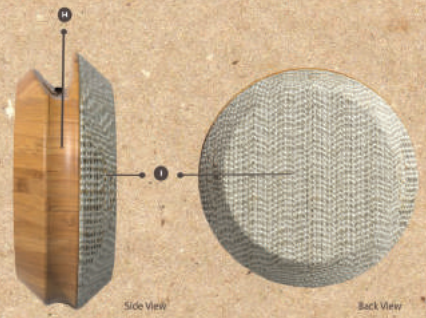
H Cable Holder
While the device is not being used, you may wire the Plant Input wire around the device in this designed for storage and portability

I Internal Speaker
Covered with Profilrated through the bamboo with circular speaker holes, allows users to hold it and engage with the sound up close to their ears.

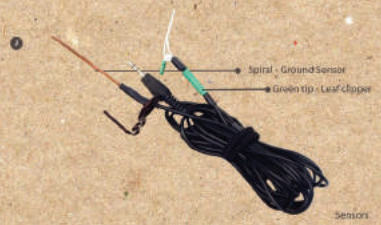
J Plant Input Wire
Green clip — to be clipped on to a leaf (apply a little water drop onto the leaf to enhance sound connection)
Spiral Sensor — to be inserted into the soil

K Charging LED
- Red : charging in progress

L Status LEDs / shows the actual status of the device.
- Red — looking for a working point
- Green — play music
- Blue / Red — no signal(no plant input cable or the resistance of the plant is too great or too small or none)



Side View
Back View



Sensors

Navigation Menu

On the device (see page 19 for general view of the device), there are four buttons for the setting of various parameters and a display with two lines of information. After starting the device, you see the status information on the display.

The up and down buttons help you navigate through the menu. As shown in figure 1, the first line of the display shows you the name of the parameter and the second line displays the actual value.

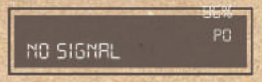


figure 1

How to move in the menu structure

With the UP and DOWN buttons allows you to scroll through the menu including the status display. After about 15s without using the buttons the display returns to the status information. With the LEFT and RIGHT buttons, you can select a choice or change the actual value to a lower or higher level. You can also scroll through the values, to see, what values are available. In 'battery mode', without using the buttons the background-light of the display switch off, after about 30 secs to save power. When you touch again the buttons the background light automatically turn on.

Setting the Language

After starting the device, you enter into the Main Menu. To change the language scroll with the Button UP/DOWN to the menu point General. Then enter the submenu with the button Right. Here scroll again to the menu point Language and then with the button LEFT / RIGHT select the language you prefer.

List of menu options

- Volume
- Profile
- Sound
  - Instrument
  - Scale
  - Reverb
  - Chorus
  - Spatial
  - Pan
  - Note wait
  - Chord
  - Base Frequency
- General
  - Background Light
  - Contrast
  - Filter
  - Language
  - Normal Setting
  - Battery
  - Version

Basic Menu Options

Users may choose between 0~15 value of the volume for internal or external speaker (if plugged in)

Predefined set of sound parameter. Users can choose one of them (P1-P8). P0 is without any fixed settings

In this submenu users can find all available sound settings. Always work in the profile P0

Enter the submenu for general settings

Choose the background light intensity between values of 0~15

choose the LCD-Display contrast intensity between values of 0~15

switch to activate/ deactivate a optionally hardware filter on the plant input

Users may choose from the following languages: English,German, Italian

Users can return to the standard values (factory settings) which were chosen before delivering the device

Displays battery status

Music Editing Menu Options

INSTRUMENT 11
089 PAD 1

Users may choose the output sound from the list of 128 instruments

SCALE
12 - TONE

Users may choose a specific scale in the following list: 12 Tone, C-Major, D-, E-, F-, G-, A-, B-, C#-, D#-, F#-, G#-, A#-Major or Pentatonic

REVERB 12

Users may choose the reverb intensity between values of 0~15

CHORUS 12

Users may choose the chorus intensity between values of 0~15

SPATIAL 07

Users can adjust the balance between the left and right speaker when device is plugged to a sound output

PAN 12

Users may choose the pan intensity between values of 0~15

NOTE WAIT 12

Users may choose the duration between one note to the next played note. Zero defines 3 notes per sec. A higher value defines a lower number of notes per sec

CHORD
3

Users may choose how the notes should be played:

- Only the actual note
- The actual note but also repeating the notes of the last 2 times
- The triad of the note according to the chosen scale

BASE FREQUENCY
432 HZ

Users may choose from following:

- 440 HZ (the actual international standard reference frequency)
- 433 HZ (a reference frequency increasingly preferred by musicians whom create relaxing music)

Device Set Up

Take the device out of its packaging (where it should return when not in use) and position it in a suitable place under the following conditions:

1. On a stable and even surface
2. Surface and surroundings must respond to the requirements specified in the relevant section of this manual: the device must be protected from humidity, wet conditions, overexposure to sun, bad weather in general, and dirt.

Search and download our "Plantiverse" app in Google Play or ITunes Apple store. Switch on bluetooth mode on both your mobile phone and the device. Sync the device to your mobile. Now you are ready to use Plantiverse app.

GET IT ON Google Play | Download on the App Store

Find A Friend

Now you may enter the Plantiverse app, tap into "Create" and you shall see a greeting from the general plant universe. Choose a plant to bond friendship with. You may befriend with a variety of choices from indoor potted plant, to bushes and flowers, to vegetable and fruit garden, to magnificent trees. As long as the plant roots undergrows into the soil, your device shall be able to pick up signals.

Once you locate a friend, a message will pop up from your friend indicating the its basic information including the plant's scientific name, its species, an infographic chart of the plant's conditions, and its location. You will then respond to the message by either selecting "Lets chat !" to befriend, or "Next Time" to look for another plant.

Initiate Friendship

After you choose a new friend, the app will ask you to take a cover photo. By doing so, you are officially initiating the conversation. The cover photo can be your new plant friend's best shot or a selfie of the two of you. Make it creative and remarkable! At any later point you are not satisfied with your cover photo, you may retrieve the steps and retake the photo.

Let the Plant Sing

Connect the electrodes to the plant as follows:

1. Connect the back clip to a metal nail (as provided on the Plant Input wire ❶) and insert it in the soil (pot or ground) near the roots of the plant or at the base of the tree.
2. Moisten the surface of a leaf and connect the green electrode to it.
3. Once the two electrodes are connected as above, insert the plug into the Plant Input ❷ of the device.

Do take notice of the monitor screen on the device. When the device is switched on, it activates an auto-range system. When the device is connected to a plant/tree, the device should start playing music after 20s -30secs. If not, please check the connection between the device and the plant.

* if the plant is properly connected, use a humid paper towel between the leaf and the green electrode, to reduce the contact resistance.

No signal (status-LEDs blue/red) The device has not found a signal in the working range. The device is not connected properly with the plant (No plant input cable ?) or the resistance of the plant it too great or too small.*

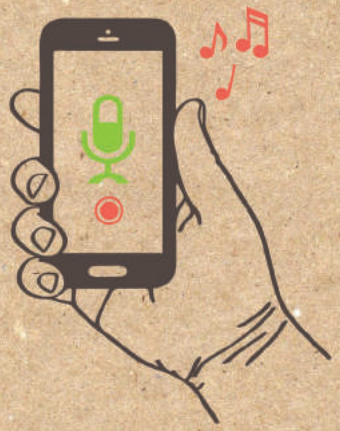
Looking for a working point (status-LEDs off/red) The device searches for a working point.

Play music (status-LEDs off/green) The device has found a working point and play music.

Record Conversation

Now you can dance, sing, jam music, talk, gently touch, sit back, or breathe on the leaves, etc. Your actions will trigger your plant friend to respond. Your plant friend may respond immediately, or sometimes it takes a little patience to wait by. Your plant friend is like an actual living being, it will respond by its will and accordingly to your actions and emotions.

Pick up your app and record the beautiful melody. You have two choices to how you would like to melody to be played out. You may connect to an external speaker or simply using the device installed internal speaker play choosing Speaker mode. Silent mode allows yourto bring the device up close to your ear and experience. You may pause recording and continue whenever you like. Once confirmed recording the conversation, tap on Stop button.



Edit Artsboard

Now you can dance, sing, jam music, talk, gently touch, sit back, or breathe on the leaves, etc. Your actions will trigger your plant friend to respond. Your plant friend may respond immediately, or sometimes it takes a little patience to wait by. Your plant friend is like an actual living being, it will respond by its will and accordingly to your actions and emotions.

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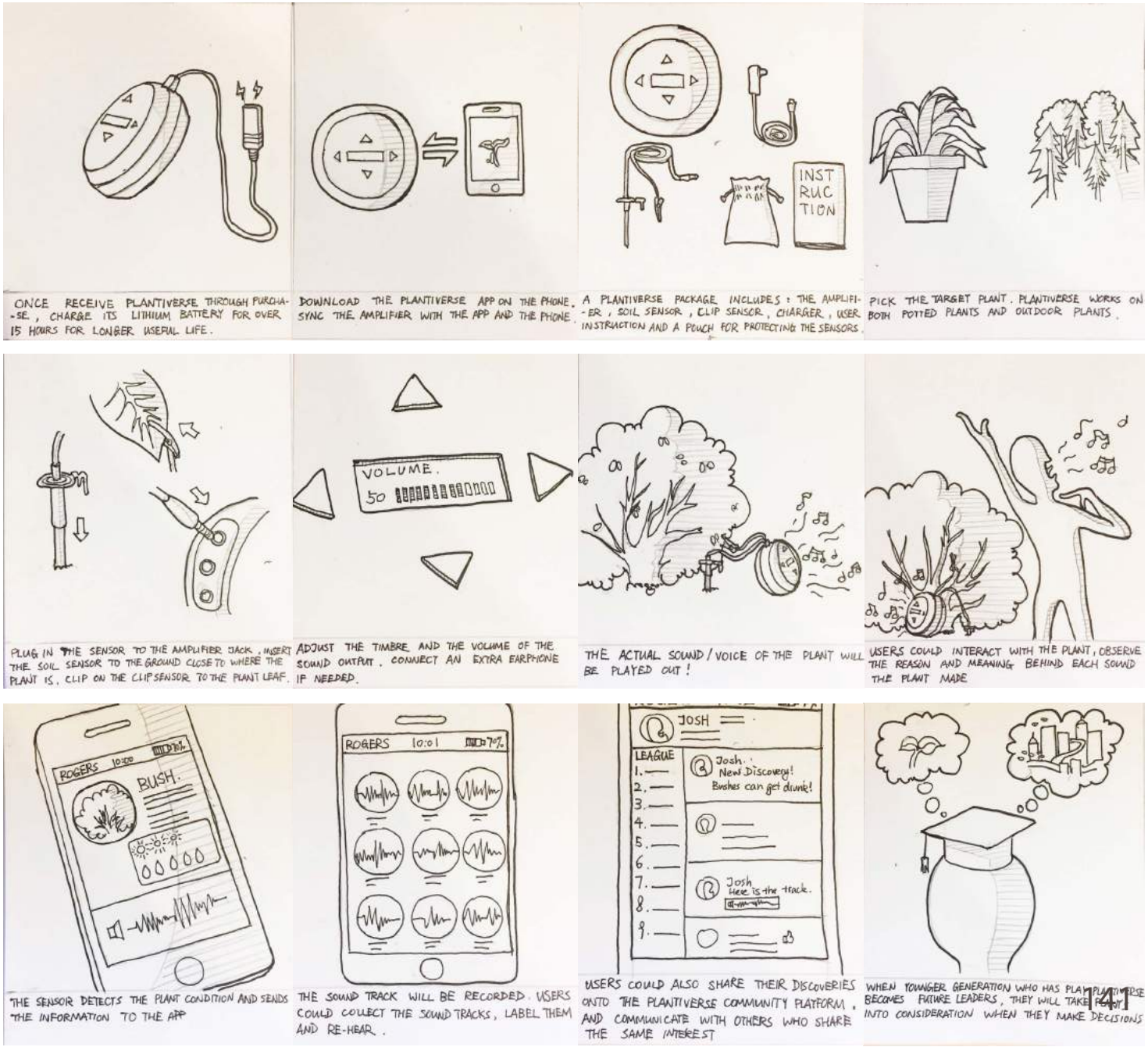
Collect and Share

After completing all actions, you may view your friendship memories under "My Collection" tab. You can choose to keep the memory to yourself or share it through Plantiverse social platform or other social medias. You may also be able to view posts from your friends and other community users. Spread the love and valuable experience for the world to see!

thank you for choosing Plantiverse.
we hope we've made some positive
changes to your world.

Campaign

Video Storyboard



ONCE RECEIVE PLANTIVERSE THROUGH PURCHASE, CHARGE ITS LITHIUM BATTERY FOR OVER 15 HOURS FOR LONGER USERUL LIFE.

DOWNLOAD THE PLANTIVERSE APP ON THE PHONE. SYNC THE AMPLIFIER WITH THE APP AND THE PHONE.

A PLANTIVERSE PACKAGE INCLUDES: THE AMPLIFIER, SOIL SENSOR, CLIP SENSOR, CHARGER, USER INSTRUCTION AND A POUCH FOR PROTECTING THE SENSORS.

PICK THE TARGET PLANT. PLANTIVERSE WORKS ON BOTH POTTED PLANTS AND OUTDOOR PLANTS.

PLUG IN THE SENSOR TO THE AMPLIFIER JACK, INSERT THE SOIL SENSOR TO THE GROUND CLOSE TO WHERE THE PLANT IS, CLIP ON THE CLIP SENSOR TO THE PLANT LEAF.

ADJUST THE TIMBRE AND THE VOLUME OF THE SOUND OUTPUT. CONNECT AN EXTRA EARPHONE IF NEEDED.

THE ACTUAL SOUND / VOICE OF THE PLANT WILL BE PLAYED OUT!

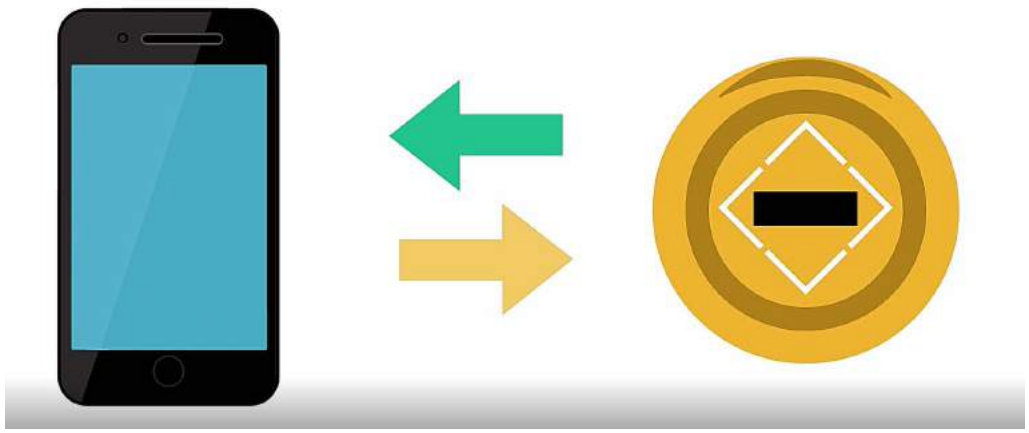
USERS COULD INTERACT WITH THE PLANT, OBSERVE THE REASON AND MEANING BEHIND EACH SOUND THE PLANT MADE

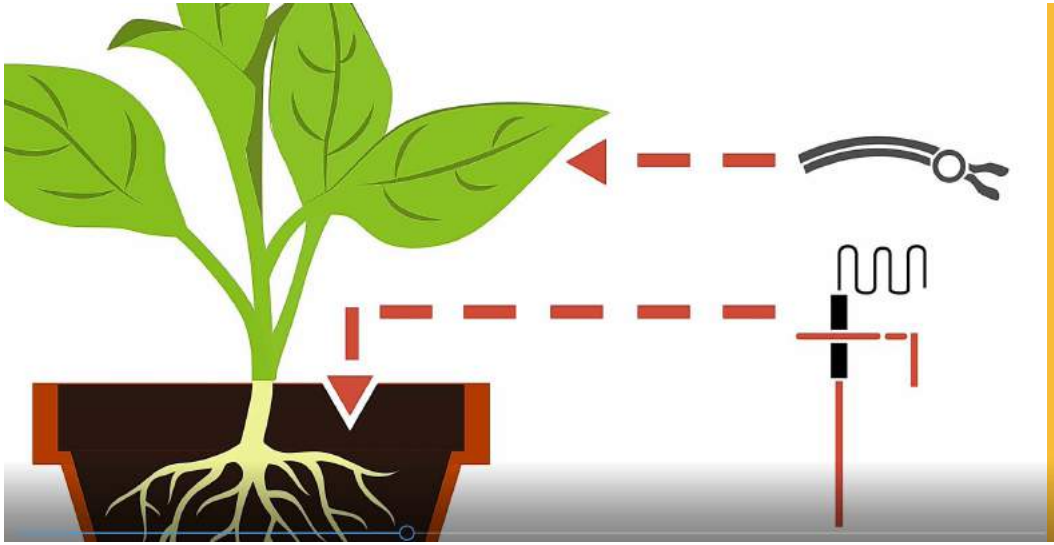
THE SENSOR DETECTS THE PLANT CONDITION AND SENDS THE INFORMATION TO THE APP

THE SOUND TRACK WILL BE RECORDED. USERS COULD COLLECT THE SOUND TRACKS, LABEL THEM AND RE-HEAR.

USERS COULD ALSO SHARE THEIR DISCOVERIES ONTO THE PLANTIVERSE COMMUNITY PLATFORM, AND COMMUNICATE WITH OTHERS WHO SHARE THE SAME INTEREST

WHEN YOUNGER GENERATION WHO HAS PLANTIVERSE BECOMES FUTURE LEADERS, THEY WILL TAKE THIS INTO CONSIDERATION WHEN THEY MAKE DECISIONS



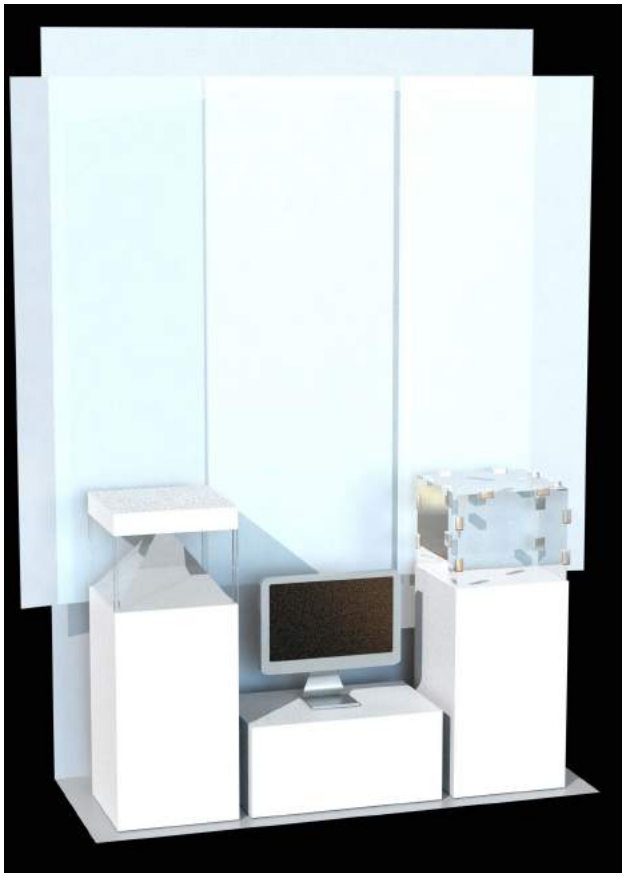


Video Screenshots

Exhibition / Inspiration

welcoming
vibrant
reindeer moss wall

Maquette



Maquette