2035 HOME *for* UNCERTAIN TIMES

MOVING IN VENICE

CAPSULA

waterproof your home

capsula

/cà • psu • la/ **noun**

1. Round or cylindrical hollow element, with the function of container, casing, coating, protection, covering or closing;
2. Space Capsule, a vehicle for space exploration.

index

about the product

/01

Venice in 2035

SCENARIO

In 2035, Venice continues to lose interest in the issue of climate change and the level of water increases without anyone noticing. Every year there is a higher sea level than the previous year. Within 15 years the change in sea level amounted to 20 cm while the annual number of tides to +25. High water reached historic highs. Piazza San Marco, the lower area of Venice, is almost perpetually under water and exceptional tide phenomena (tide> 140cm) are increasingly frequent.

capsula.

WATERPROOF YOUR HOME

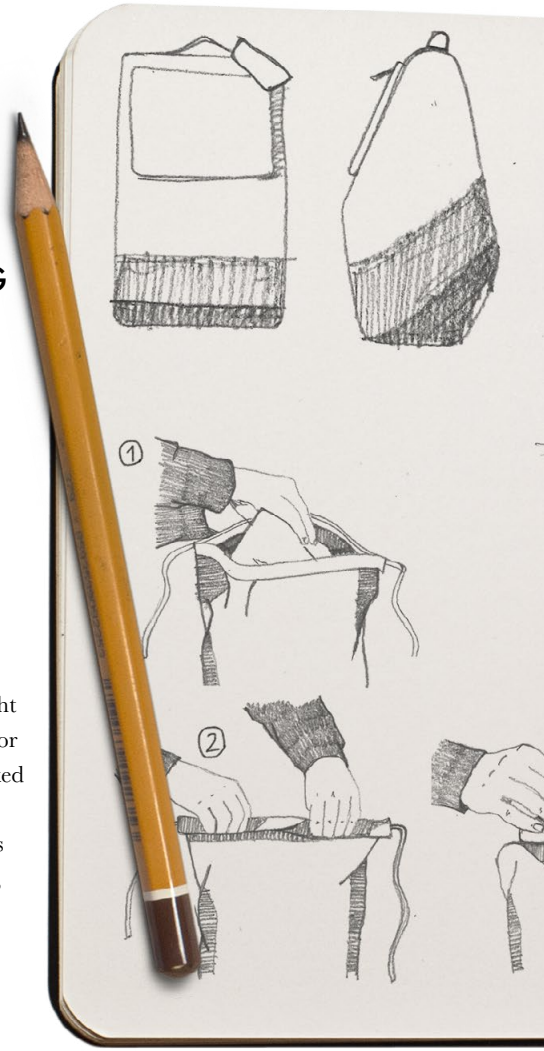
WATERPROOF YOUR HOME

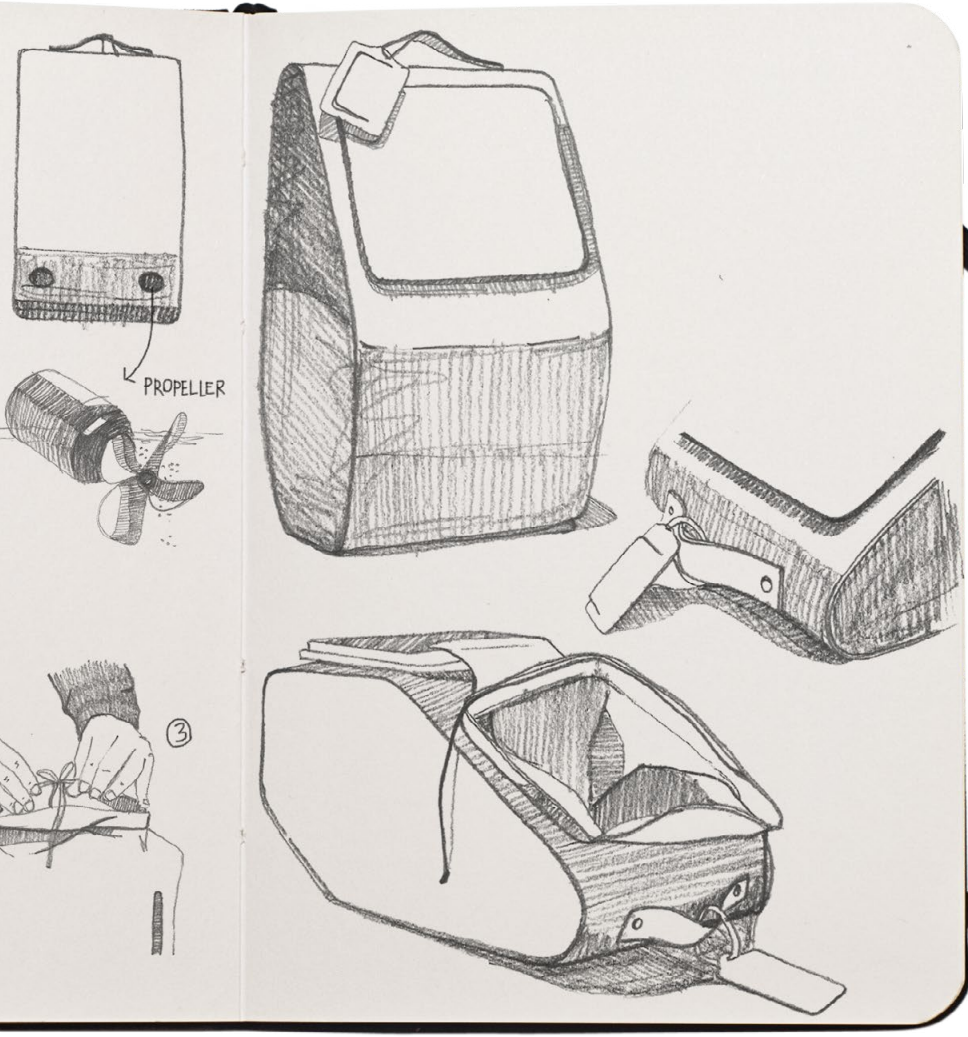
Capsula is designed for being a waterproof container to store and protect your most precious things from water rising inside your home. Completely handmade from start to end, it embodies the values of the craftsmanship of woodworking. The elegance of the wood combined with a leather touch of colour will add more value to your house furniture.

concept

A WATERPROOF MOVING CONTAINER

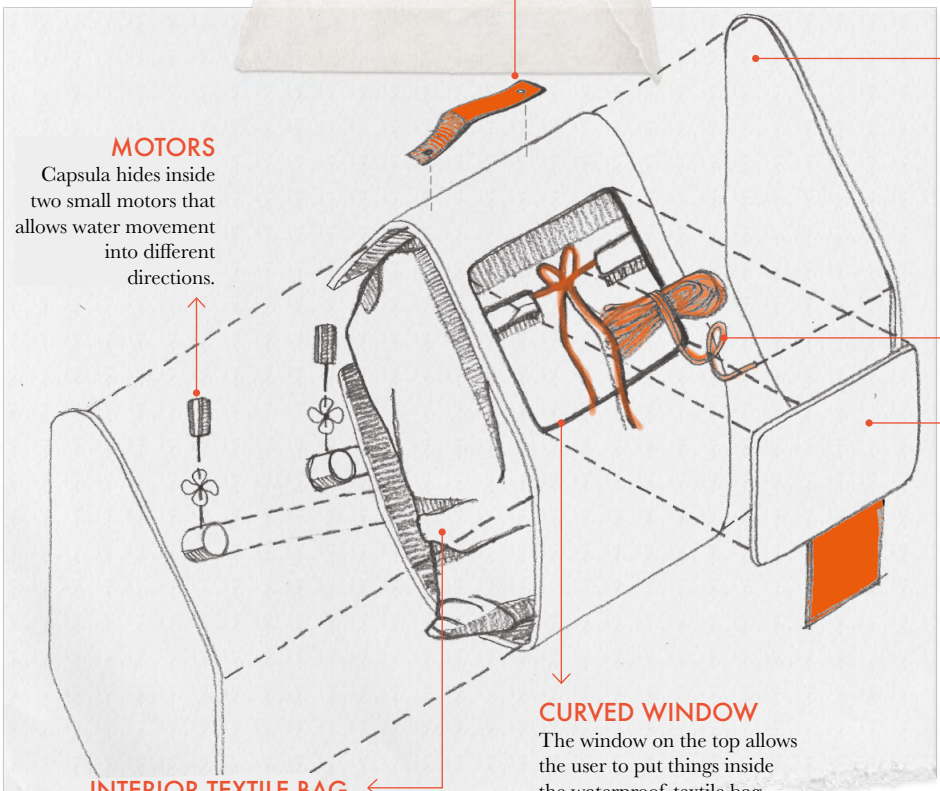
In a scenario of 2035 Venice one of the most important needs will be to protect from water the things you love the most inside your home.
We started thinking about a waterproof container to hold in your house, like a beautiful piece of furniture to store the things you would never lose in a flood.
The product shape is taken by the golden proportion and it's studied to allow the object to float and fall on water in the right position due to weight balance. An exterior wooden shell houses a waterproof bag fixed with a rolling closure.
Inside weight (max 7 kg) and object status can be controlled through an application, that allows the bag to reach you outside home moving into water.





/01

details



MOTORS

Capsula hides inside two small motors that allows water movement into different directions.

CURVED WINDOW

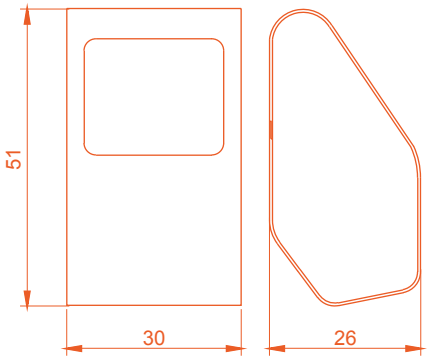
The window on the top allows the user to put things inside the waterproof textile bag, fixed around the window with waterproof glue not to allow the water to enter into the wooden structure. It has curved angles to assure more resistance to the material

INTERIOR TEXTILE BAG

The interior part is made by a transparent waterproof textile bag with a waterproof rolling closure to keep safe all the inside from water. It's divided into three areas with guided object introduction. The dimensions are studied to put inside nearly all your most important things.

LEATHER HANDLE

A beautiful leather handle positioned on the top of Capsula wooden structure gives a touch of color and style to the object with the function of grip point to get the object out of water. It supports a leather tag and both are customizable in the colour palette.



EXTERIOR WOODEN WATERPROOF STRUCTURE

The exterior of Capsula is completely waterproof and handmade by wood. Wood gives to the object elegance and resistence it needs. The wood pieces has been assembled with waterpoof glue and all the exterior has been treated with flatting to make it waterproof.

LEATHER LACE

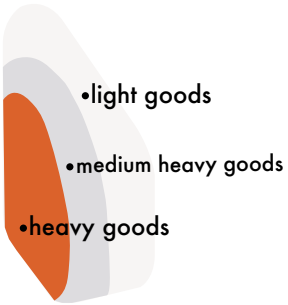
The lace is sewed with the transparent interior bag and allows a beautiful closure at the end of rolling.

WOOD CAP

An elegant wood cap closes the window with an ermetical system to confer protection and safety. The cap has an integrated fingerprint technology connected to lock and unlock the bag.

INNER WEIGHT DISTRIBUTION

The internal distribution of the weights of the objects, in order to guarantee a thrust in the correct direction for the fall of the capsule in water and its balanced floating, must follow the scheme shown here.



capsula unique

CREATE A LOOK THAT IS UNIQUELY YOURS

This is your chance to put your own touch on your suitcase. Use the capsula unique customization service and configurator to choose from a range of colourful accents and accessories, to distinguish your capsula case on the go and make it your style.

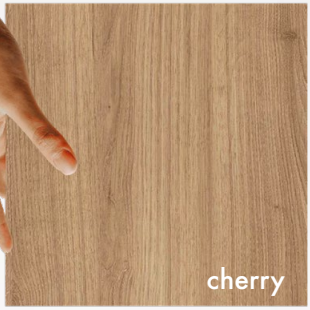
about the product

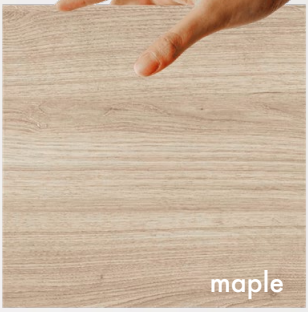
/01

/01 COSTUMIZE YOUR CLASSIC CAPSULA

Start customizing your piece of furniture by adding pops of colour to your **capsula** classic's handles, closing laces and choosing your favourite wood essence.

/ WOOD ESSENCES





Given the natural variations of wood, trust that your piece will have it's own **unique grain and color**.

/ HANDLES AND CLOSING LACES COLORS

Those two details are made of **full grain leather** and you are able to select the color you **prefer,** as soon as you have the chance to do it, don't miss it!

PAPRIKA HONEY AZURE OCEAN

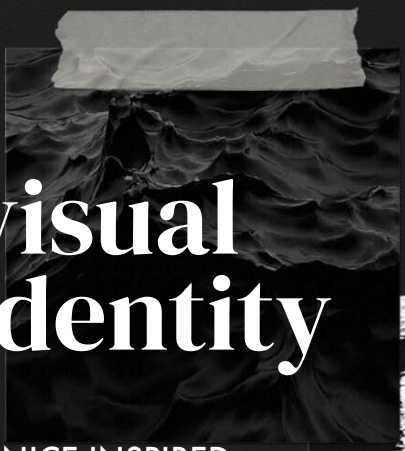
BLUSH SNOW CLEMENTINE LAGOON

/02 ADD A PERSONAL FINISHING TOUCH

Add your leather luggage tag to ensure your **capsula** always stays by your side.

about the product

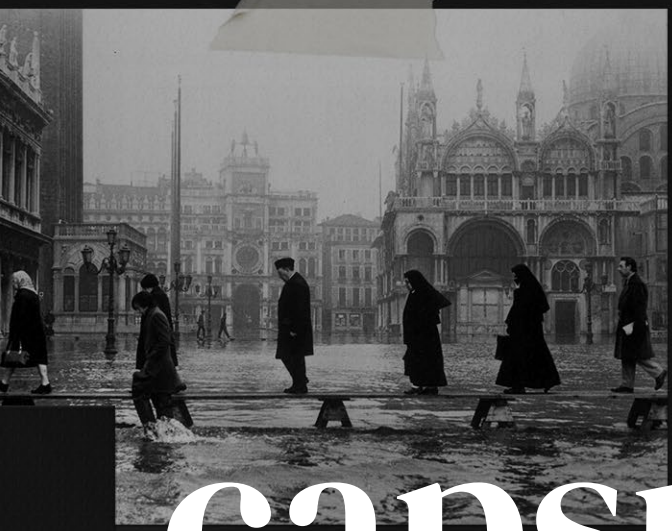
/01



visual identity

VENICE INSPIRED

Capsula visual identity takes inspiration from Venice atmosphere. Elegance, culture and romanticism are the main carachteristics. Water is the key element for the existence of Capsula, so it's present almost in every Venice picture to convey the importance of floating and waterproofness of the product.



capsula.

WATERPROOF YOUR HOME

a.

about the product

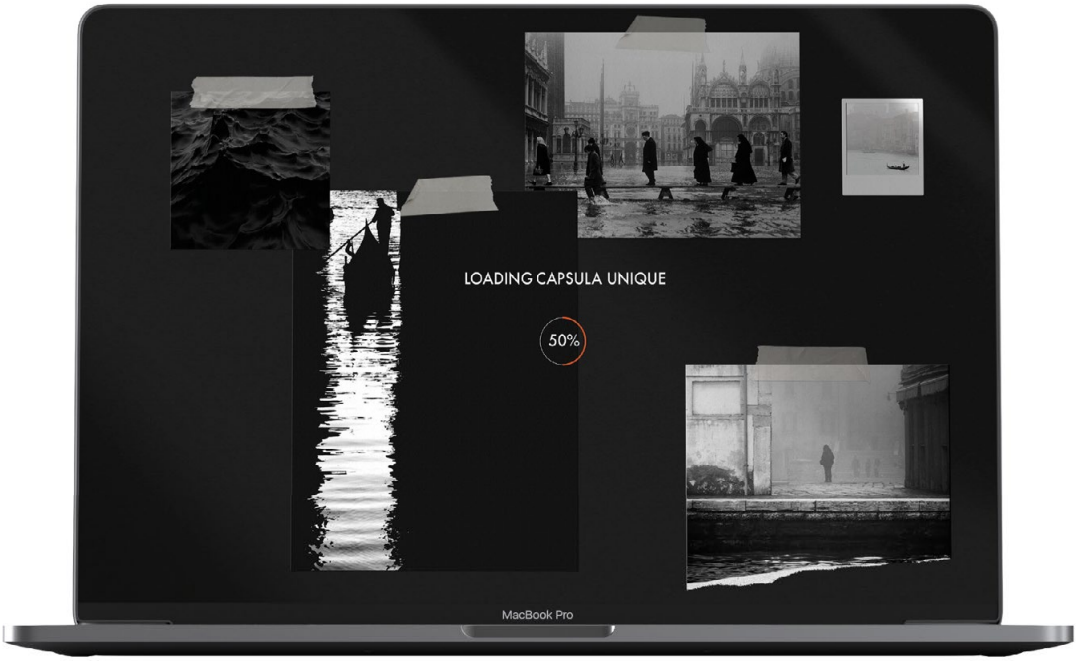
/01

NEWSPAPER ADVERTISING

MAGAZINE ARTICLE

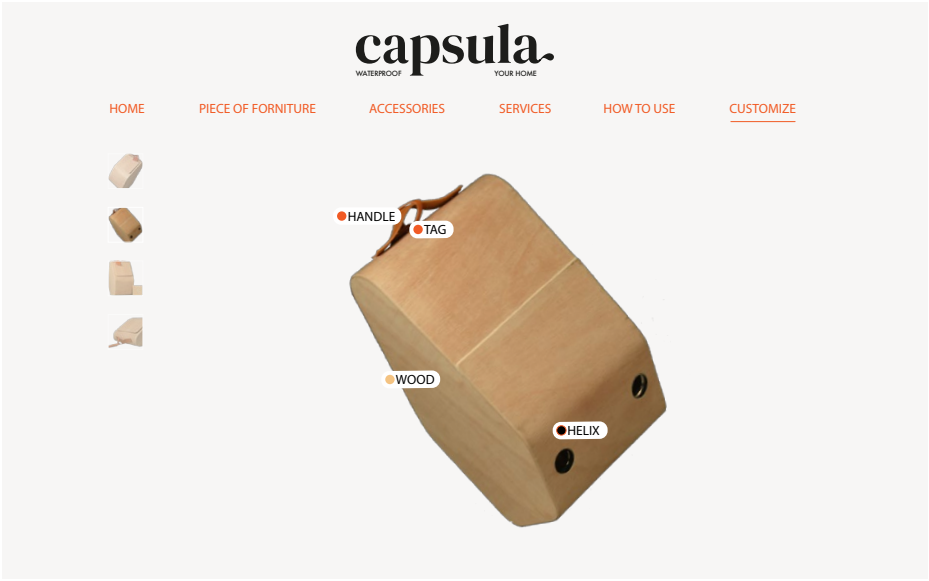

caps
WATERPROOF

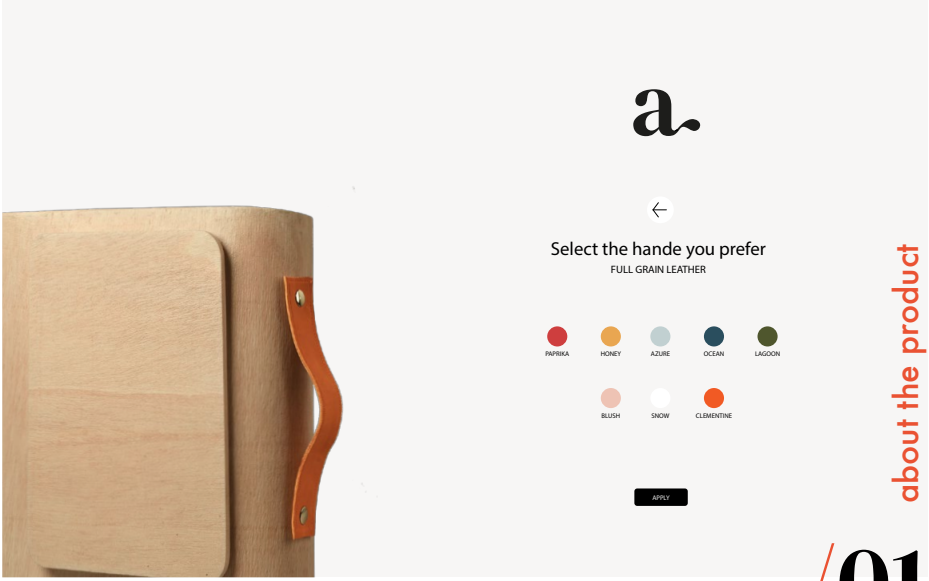
AFFICHES



capsula.
WATERPROOF YOUR HOME

HOME PIECE OF FORNITURE ACCESSORIES SERVICES HOW TO USE CUSTOMIZE





about the product

WEB SITE

/01

about the service

/02

Matteo


ANTOINE DE SAINT-EXUPÉRY
Il Piccolo Principe
tell me a story
A TRIP TO THE MOON
5..4..3..2..1 BLAST OFF!

ABOUT

/ 6

/ He dreams of becoming an astronaut

/ Venice, Italy

/ “To infinity and beyond!”

/ Matteo is a child full of dreams; his best secret wish is to become an astronaut. His family is humble but able to convey trust in following dreams since he was very little. His father used to tell him stories about the moon to make him fall asleep. Despite his early age, he grew a strong passion for everything about space, and started collecting articles and spaceship toys that were gifted to him. These are his most precious things that he wouldn’t want to lose for any reason.

LIKES

/ play with space toys

/ read stories

/ cook sweets

/ attend science lessons

DISLIKES

/ to play football

/ listen to music

/ attend birthday parties

/ listen to mum’s rules

GOALS

/ never stop to follow his dream

/ take care of his toys

/ have a good time with his school friends

/ share his discoveries with friends

PERSONALITY

TRAITS

Arianna

ABOUT

/ 21

/ She wants to become a professional designer

/ Venice, Italy

/ “Good things take time”

/ Arianna is a design student in Venice. She likes living in her city a lot, and she’s proud of its cultural and architecture heritage, that she is thinking to continue living there. Arianna, as a designer and passionate about literature, architecture and photography has a lot of things she can’t live without like her personal devices and her favorite books and printed memories.

LIKES

/ to read books

/ project new things

/ write

/ travel and take photographs

DISLIKES

/ use social media

/ touch her personal things

/ home cleaning

/ watch horror films

GOALS

/ become a good designer

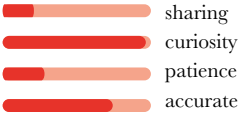
/ discover new things

/ travel all over the world

/ write her own book

PERSONALITY

TRAITS



Mara


john steinbeck
of mice and men
john steinbeck
the grapes of wrath
john steinbeck
East of Eden
CANAPES

ABOUT

/ 52

/ Psychological, mum, wife, healthy style

/ Venice, Italy

/ “Happiness is always the key”

/ Mara is a middle age girl with responsabilities and tasks of an adult satisfied girl. She is a happy mum of two, a freelance worker, she is able to manage her time to satisfy her goals. She also cares a lot about healthy life and usually spends time reading, studying for improving herself in her job, and training and cooking healthy food for her family. She’s very skilled in time managment, and always have her personal devices with her to helping her lifestyle, which she cannot live without.

LIKES

/ read books

/ walk in nature and collect butterflies

/ cook healthy recipes

/ have good times with her children

DISLIKES

/ disorganized people

/ negative vibes

/ volleyball

/ smoking

GOALS

/ improve her knowledge

/ live in a happy family

/ lead a healthy and balanced lifestyle

/ plan new travellings

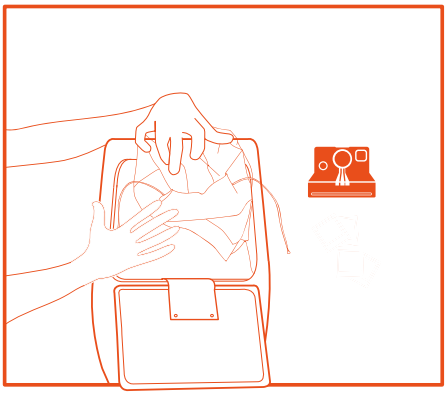
PERSONALITY

TRAITS

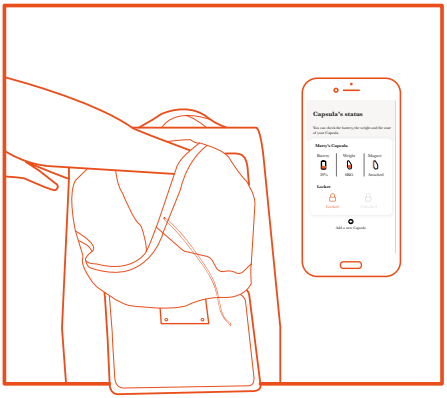
instructions

Download the application and connect with your Capsula

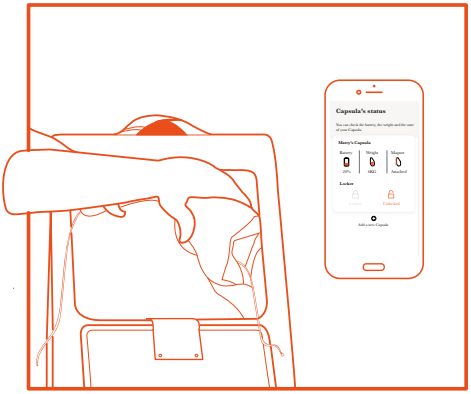
Open Capsula and store inside your precious objects



Control the weight through the application

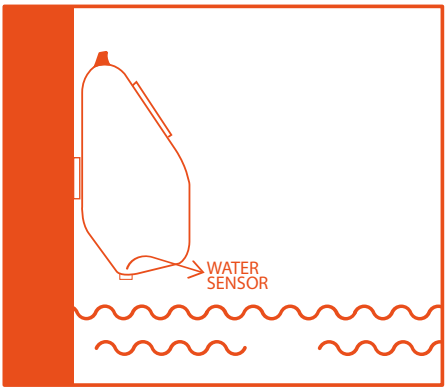


Close your Capsula and lock through the application

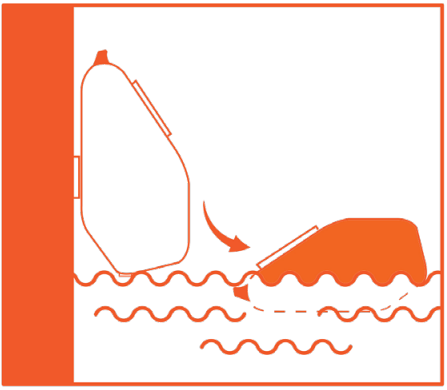


Install Capsula hanging it through the magnetic system

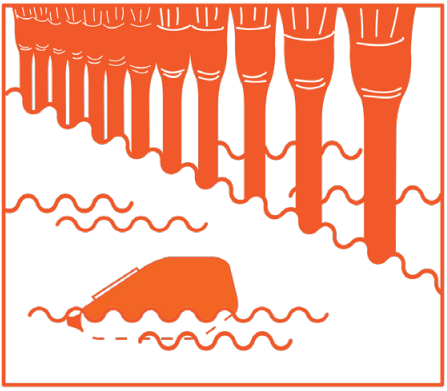
In case of floods Capsula water sensor feels water rising



The magnet release its power and let Capsula fall on water

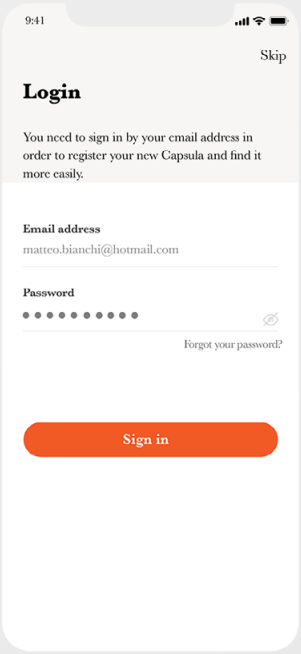


Capsula is able to reach you outside home using GPS system



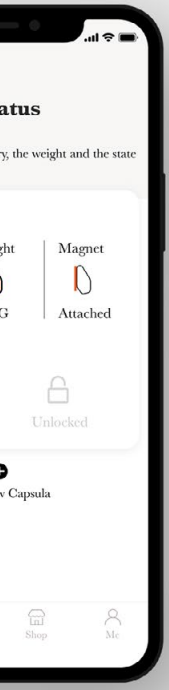
Capsula finally reaches you taking care of your treasures

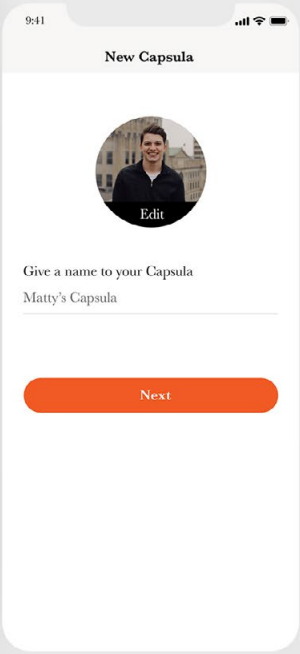
app prototype



CONTROL YOUR CAPSULA

Capsula application helps the customer to check and keep his Capsula status everytime and everywhere under control; battery, inner weight and locking system.





annex

/03

/01

Selection and purchase of plywood

We went to one of the largest timber companies in the province and bought bendable plywood of two different thicknesses.

/02

Wood cutting

Wooden panels have been cut into pieces of suitable size to make our product. In detail, a 30x120 cm bendable strip is needed to make the central part and two 30x45 pieces for the section.

/03

Wood smoothing

Once the rough pieces were cut, we proceeded to finish them with handmade abrasion.

/04

Immerse wood in water

To make the wood more flexible so that it can curve, we immersed it in water for a whole night.

/05

Wood curving on foam demo and drying

Still wet, we curved the wood by adhering it to a foam demo realized before and fixing it with straps. Then we dried the wood and leave it in place for a day.

prototype process

/06

Assembling wood parts

After removing the straps, we fastened the side pieces to the curved part with waterproof glue and screws.

/08

Handle and interior bag sewing

Once the wooden structure was assembled, we took care of sewing the pieces of fabric for the leather handle and the inside of the bag.

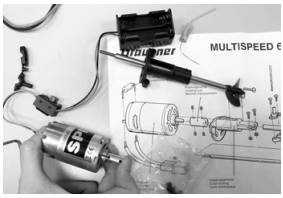
/10

Assembling wood structure and interior bag

Once all the pieces were made, we fixed the handle with rivets drilling the wood, and the inner bag with waterproof glue along the opening part.

/07

Adding the motor



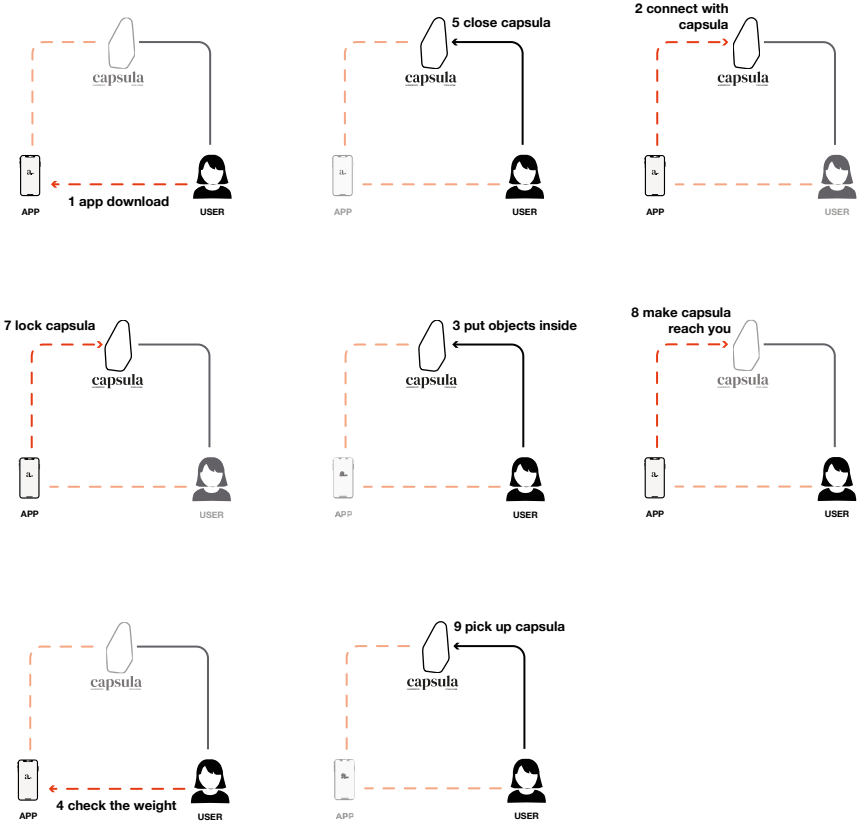
We assembled the motors and put them inside the bag leaving the helics visible from the back put into two stainless steel cilinders.

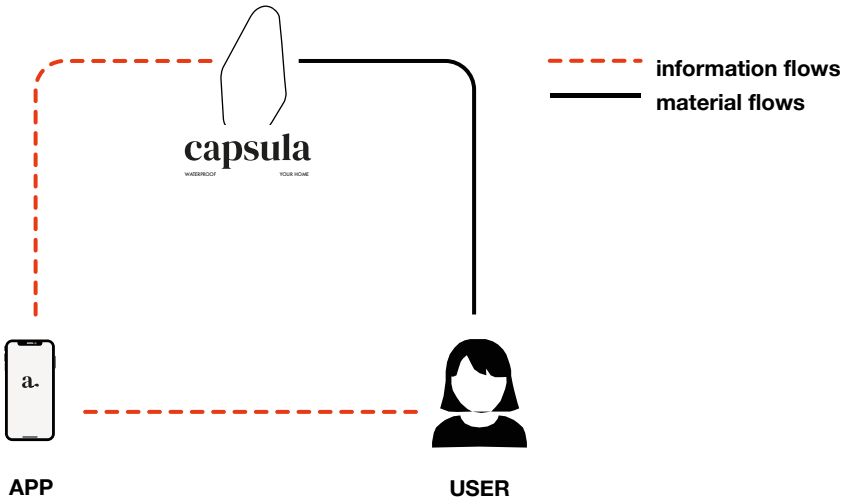
/09

Wood waterproofing

To make the wooden container completely waterproof, we sealed the closings again with glue internally and treated the entire external surface with flatting.

system map


capsula
APP
1 app download
USER
5 close capsula
2 connect with capsula
7 lock capsula
3 put objects inside
8 make capsula reach you
4 check the weight
9 pick up capsula



SERVICE' COMPONENTS

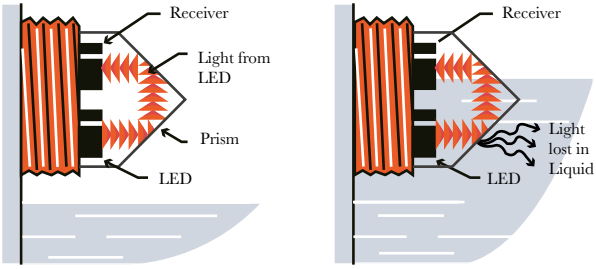
Capsula service is composed by three main components: Capsula, Capsula application and Capsula owner. The previous service map describe step by step the service and the relationships between the three components.

service technology

WATER SENSORS

When the water level reaches the bottom of capsula, magnet loses magnetism and it falls down.

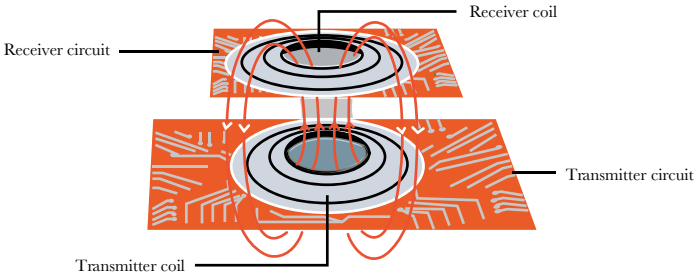
The photoelectric water level sensor contains a near-infrared light emitting diode and a photosensitive receiver. The light from the light-emitting diodes is directed into a lens on top of the sensor. When the liquid immerses the lens of the photoelectric water level sensor, the light is refracted into the liquid, so that the receiver cannot receive or can only receive a small amount of light. The photoelectric water level sensor senses this operating condition change, and the receiver can drive the internal electrical switch, thereby starting an external alarm or control circuit. If there is no liquid, the light from the LED is reflected directly from the lens back to the receiver.



WIRELESS CHARGING

When the capsula has no battery, you just need to hang it on the wall and it can charge wirelessly through magnetic field.

/1 Mains voltage is converted into high frequency alternating current (AC).
/2 The alternating current is sent to the transmitter coil by the transmitter circuit.
/3 Alternating current flowing within the transmitter coll creates a magnetic field which extends to the receiver coil (when within a specified distance).
/4 The magnetic field generates current within the receiver coil of the device.
/5 Current flowing within the receiver coil is converted into direct current (DC) by the receiver circuit, thus charging the battery of the device.



WEIGHT SENSORS

Weight the objects inside the capsula

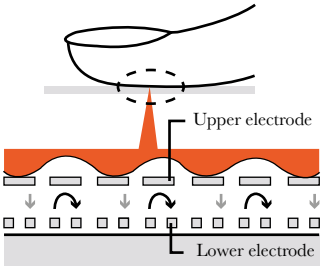
Build a weighing machine by using Arduino and Load cells. Load cell is transducer which transforms force or pressure into electrical output. Magnitude of this electrical output is directly proportion to the force being applied. Load cells have strain gauge, which deforms when pressure is applied on it. And then strain gauge generates electrical signal on deformation as its effective resistance changes on deformation.

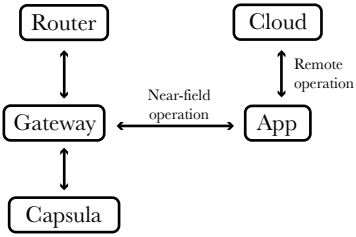
service technology

FINGERPRINT LOCKING

Open the cap by your fingerprints and app.

The electric field is formed by the silicon crystal element and the conductive subcutaneous electrolyte. The fluctuation of the fingerprint will cause different pressure differences between the two parts. This can achieve accurate fingerprint measurement and unlock.
The unlocking information (password, fingerprint, etc.) is stored in the lock body. The cloud, router, and gateway only play the role of transmitting information, and the mobile phone app only plays the role of issuing instructions.

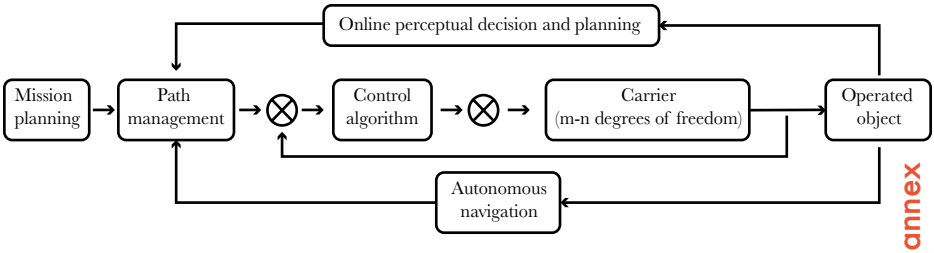




CAPSULA MOVING SYSTEM

Know the location of capsula at any time and use your phone to let the capsula come to you.

By the GPS system, you can know the location of your capsula at any time. The system of "come here, capsula!" is similar to the unmanned aircraft system(UAS), which include an unmanned aerial vehicle (UAV), a ground-based controller, and a system of communications between the two. The flight of UAVs may operate with various degrees of autonomy: either under remote control by a human operator or autonomously by onboard computers.



floating test

FLOATING

The physical law behind the floating of a body is known as the **Archimedes principle:**
"a body, immersed in a fluid, receives a direct thrust from the bottom up and with an intensity equal to the weight of the volume of liquid displaced".
The thrust, therefore, is proportional to the density of the liquid in which the body is immersed and the volume of the part immersed in the liquid.

Basically, a body immersed in a liquid is subject to **two** distinct and directed **forces** in the opposite direction:
• **body weight (F)**, directed towards the center of the earth, that is, towards the bottom;
• **weight of the mass of liquid displaced by the presence of the immersed body part (S)**;
This force, directed upwards according to the principle of Archimedes, is given the name of **thrust.**

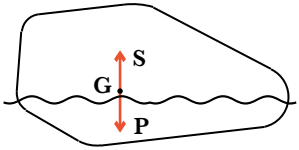
In order for the body to remain afloat and maintain the desired structure (keep in balance) it is necessary that:
• the two aforementioned forces have the same intensity (weight and thrust the same value);

• the lines of action of the two forces coincide (weight and thrust act the same line, each in the opposite direction to the other);

S = ml · g = pl · Vimm · g

P = mc · g = pc · Vtot · g

For the body to float pc < pl



Considering the maximum capacity of the bag, we calculate its specific weight taking into account the maximum body weight (empty capsule + internal load).

V(capsula) = A(section) · l **=** 1018,5·30 = 30555 cm³ = **30,56 dm³**
m(capsula) = V(capsula) · pw(wood) = 30,56 dm³·0,15kg/dm³ = **4,584 kg**
m(max) = m(capsula) + m(interior) = 4,584+7 kg = **11,58 kg**

pc (full capsula density) = m(max) / V(capsula) = 11,58 kg/30,56 dm³ = **0,38 kg/dm³**
pl (water density) = 0,997 kg/dm³

pc < pl ⟶ Capsula floats on water

Immersed Volume
Vimm= (pc/pl)·V(capsula)= 0,38/0,997·30,56= **11,64 dm (26,25%Vtot)**

STABLE BALANCE

Taking into consideration the specific case of the ship to show Capsula conditions of stability in water verified:
• the **weight force**, which is given the name of displacement (indicated the letter D), is **applied in the**

center of gravity of the ship, (indicated with the letter **G**);
• the **thrust**, (indicated with the letter **S**), is applied to a point Cs (thrust center) of the mass of water moved from the part of the hull to which the name of "carena" is given. This point is difficult to determine, but it can be shown that it is on the vertical at the water plane passing through the center of the hull volume which is called "hull center" (indicated with the letter B), at a height (ie at a depth) greater than this last. For practical reasons, it was agreed to consider the hull center B as the point of application of the thrust. In light of the above, **in order for the ship to float (in straight balance) it is necessary:**

• that points **G and B belong both to the vertical passing through G and** to the **floating plane of the ship;**
• that **thrust S and displacement D are equivalent;**
• that the hull is not totally immersed.

The equilibrium must therefore be necessarily stable, that is to say that with every heeling cause the ship must react tending to return to the initial position, that is straight. This condition occurs when the relative positions of the ship's center of gravity G and the center of the hull B are such that any heeling cause generates an antagonistic pair, analytically represented by a moment, defined with the rules of applied mechanics (product of a force for an arm). In naval architecture this pair is called, in fact, pair or moment of stability.

pl (water density)= 0,997 kg/dm^3

annex

/03


capsula.
waterproof your **home**