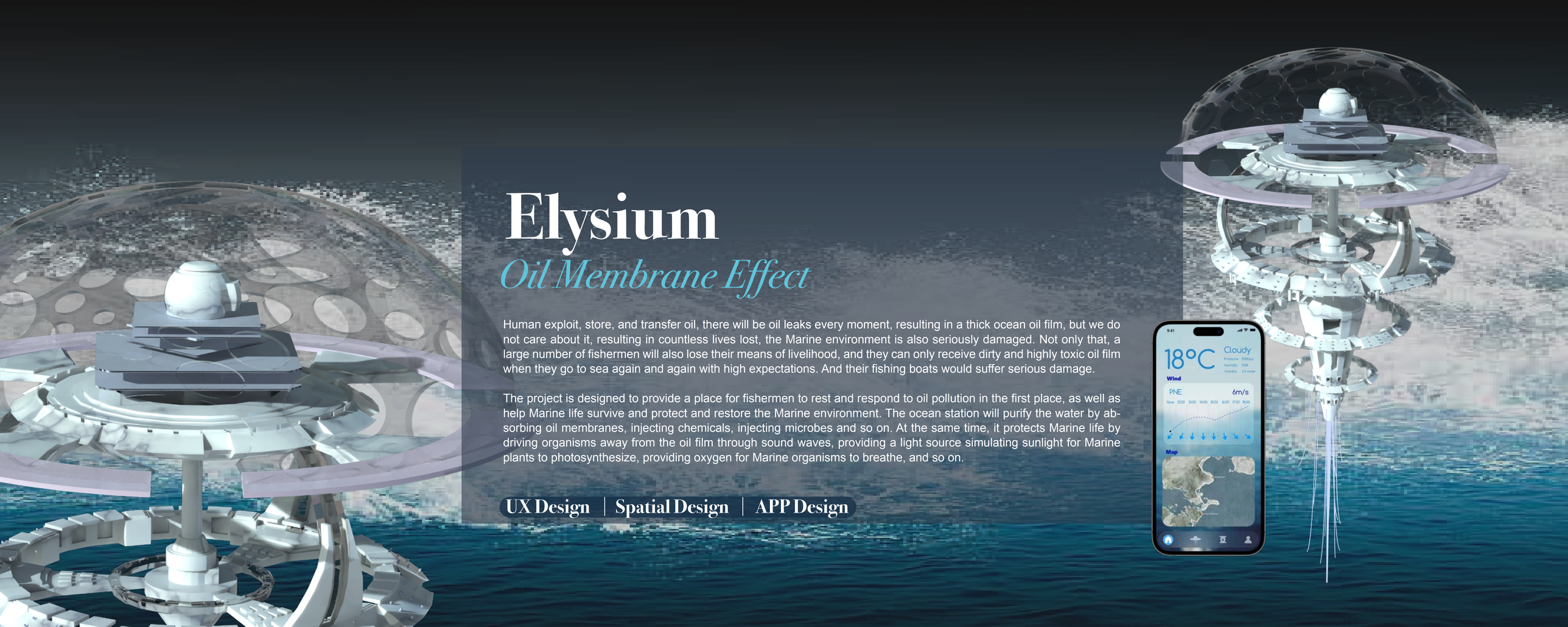


Elysium

Oil Membrane Effect

Human exploit, store, and transfer oil, there will be oil leaks every moment, resulting in a thick ocean oil film, but we do not care about it, resulting in countless lives lost, the Marine environment is also seriously damaged. Not only that, a large number of fishermen will also lose their means of livelihood, and they can only receive dirty and highly toxic oil film when they go to sea again and again with high expectations. And their fishing boats would suffer serious damage.

The project is designed to provide a place for fishermen to rest and respond to oil pollution in the first place, as well as help Marine life survive and protect and restore the Marine environment. The ocean station will purify the water by absorbing oil membranes, injecting chemicals, injecting microbes and so on. At the same time, it protects Marine life by driving organisms away from the oil film through sound waves, providing a light source simulating sunlight for Marine plants to photosynthesize, providing oxygen for Marine organisms to breathe, and so on.

UX Design | Spatial Design | APP Design

Oil Membrane Effect

Background

In the process of oil exploitation, refining, storage, transportation and use, a lot of **oil will be leaked into the ocean**, so that oil will **form an oil film** floating on the sea (called **OME**)

Affected aspects

1 to 1.5 million tons of oil are released into the ocean every year

Seriously damaged the **eco-logical environment and atmospheric balance**

At least for **ten days to a month,** the oil floats on the surface

About oil film

When oil enters the water, it ***forms an oil film on the surface of the water***. Each drop of oil can form an oil film of 0.25 m² on the water surface, and each ton of oil can cover 5×106 m² of water surface. The oil film ***isolates the water from the atmosphere***, reducing the dissolved oxygen in the water, causing the water to turn black and stink, and life to die

Effects of oil pollutants

Fishery

Pollution can directly kill fish. It will make fish and shrimp produce special smell and taste, which can not be eliminated and affect sales.

Animals

Fish are very sensitive to oil, their nerve centers are very close to the epidermis, and toxic substances can easily enter the body.

Human

Oil pollution affects human organs and causes various diseases. The incidence of liver cancer and mortality increased significantly.

Treatment method

Physics ***Secondary damage***

Oil absorption rope and oil absorption cotton lock the oil leakage area

Biology ***Waste a long time***

Some microorganisms can break down oil into water and carbon dioxide

Chemistry ***Harmful residues***

An activator that disperses large oil droplets into smaller ones for bacteria to break down

Conclusion

The impact of OME is very large and very bad, not only harmful to organisms, but also great damage to the environment. Severe OME is almost 100 percent lethal to organisms and has a very large impact on the atmospheric circulation system

Seabirds also often swallow oil or its derivatives, causing fatal damage to their **internal functions and nervous systems**

OME invade seabird feathers, causing them to **gain weight and lose the ability to fly**

Oil fill the Spaces between the feathers, which destroys the tion properties of the feathers, and is prone to death from cold

They will be **panic** and **repeatedly dive** to wash the oil off their feathers,which accumulate more on the feathers, accelerating the process of death

Observation & Interviews

- Do not know where OME occurs in real time
- Drugs have side effects on other organisms
- OME causes a significant reduction in fish
- Fish that survive with OME are also toxic
- Don't know what to do about OME at all

- I felt ***helpless and depressed***. The number of ***fish is greatly reduced***, which is a big blow to our fishermen. I ***don't know how to cope.***

- Survivors have been so badly infected with oil that they can ***hardly be sold to the market.***OME will get us ***nowhere and destroy our fishing boats.***

- We currently have very little communication with fishermen, and we have ***no way of knowing where OME occurs***

Design Concept

Design Opprtunities

For Environment

Oil pollution treatment equip-ment;
Reducing environmental load while extracting oil;
Maintain the balance of Marine ecology

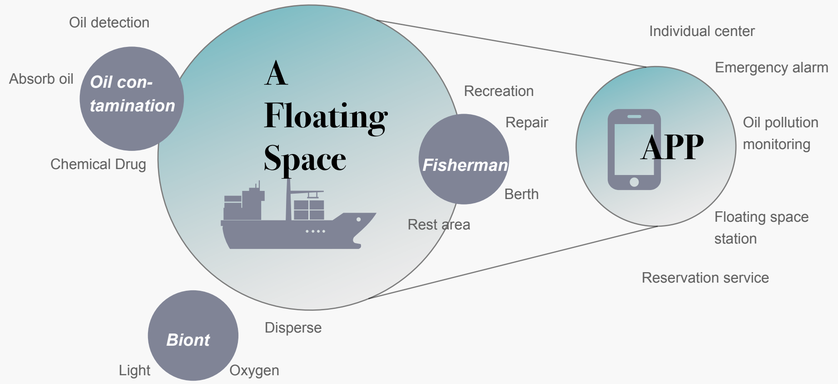
For Human(fishman)

Provide early warning of oil pollution;
Provide rest/supplies; Provide security measures

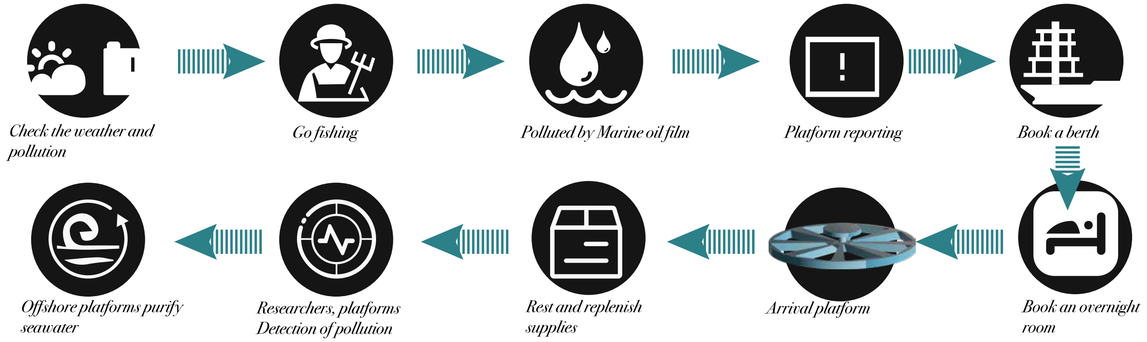
For Animals

Drive away in time; Improving the Marine living environment;
Timely treatment of oil pollution

Idea Development

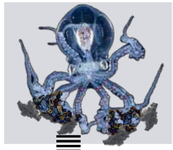


User Service Process



Exterior Design of the Space

Inspiration

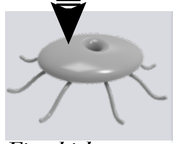


Styling - Tentacles
- Octopuses have many tentacles with suckers

Function - Perception
- They have a high sense of perception

Function - Inhalation
- They use suckers to grab prey into the mouth

Function - Release
- Tentacles have suckers that release ink



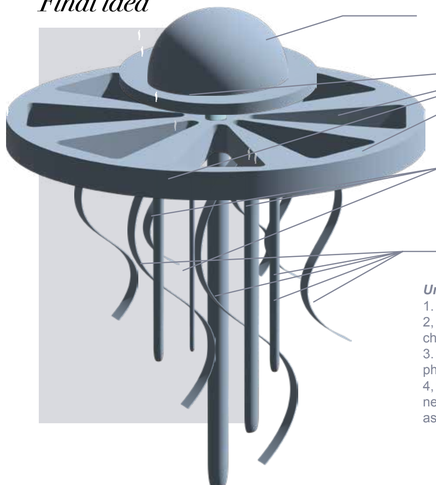
Tentacles - Compatibility

Perception - Monitoring pollution

Inhalation - Absorb oil

Release - Release chemicals

Final idea



Rest, recreation area:
Fishermen can rest, supply, entertainment here

Ferry port:
Fishing boats can dock here, rest, supply, repair and so on

Oil pollution detection:
To detect whether the nearby sea water is contaminated by oil

Underwater tentacles:
1. Detect whether the sea water is contaminated by oil
2, release microorganisms, drugs, etc., through chemical methods to decompose oil
3. Absorb oil, absorb and filter seawater through physical means
4, water sonar, by releasing interference electromagnetic waves or sound to drive away nearby organisms, as far as possible to reduce biological pollution

Final Design Concept

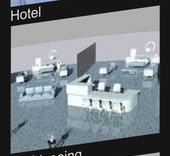
Local Perspective

Central control

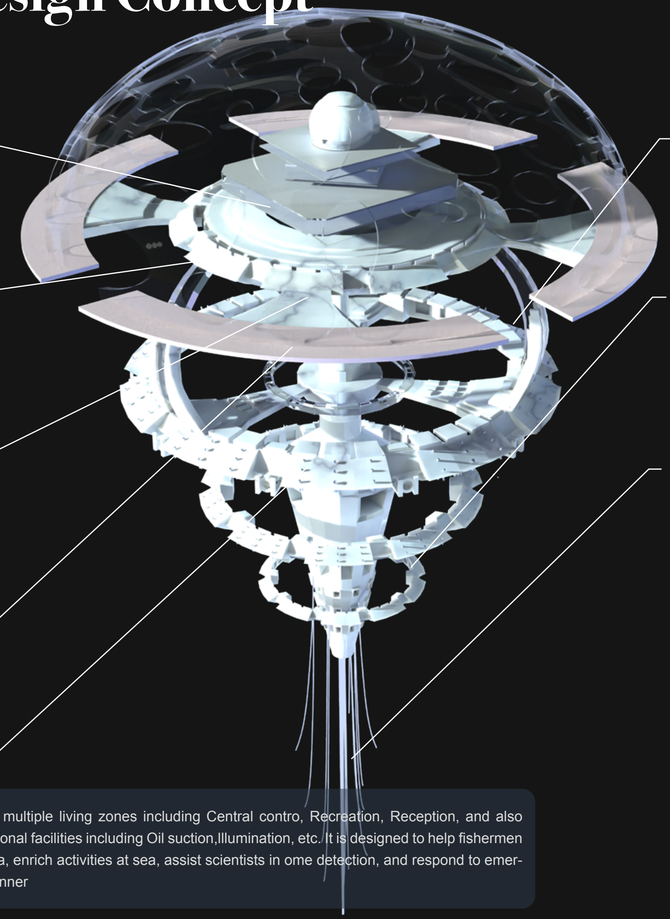
Recreation

Reception

Hotel



Sightseeing



The platform features multiple living zones including Central contro, Recreation, Reception, and also includes multiple functional facilities including Oil suction,Illumination, etc. It is designed to help fishermen improve their life at sea, enrich activities at sea, assist scientists in ome detection, and respond to emergencies in a timely manner

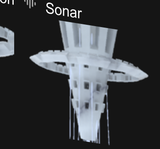
Sectorization

Oil suction

Illumination

Oxygen injection

Sonar



Drug injection & Probe

Solar panel

Vegetational region

Technical Analysis

--Elimination of OME

Oil stain eliminator
- It makes the oil spill disperse and the oil film disappear.

Oil coagulant
- It causes the spilled oil to coagulate.

Oil collecting agent
- It gathers dispersed oil together without causing it to gel.

Oil containment boom
- Enclose the oil to prevent it from spreading

Adsorption method
- It is used to adsorb oil from the sea surface

--OME monitoring

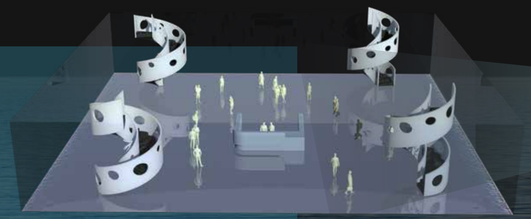
SAR

Remote sensing monitoring

Details of the Service Process

First Floor:Recption

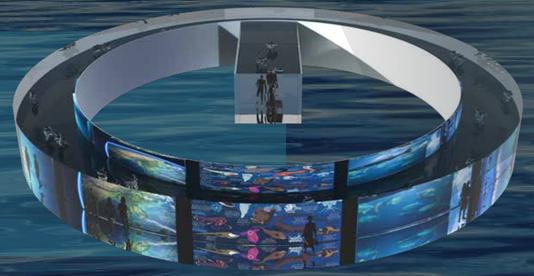
The front desk welcomes incoming fishermen or tourists and provides them with services such as check-in to help them understand the area



Reception

Sightseeing

A panoramic sightseeing area for fishermen and tourists, where they can observe real fish and also see some of the working facilities of the platform

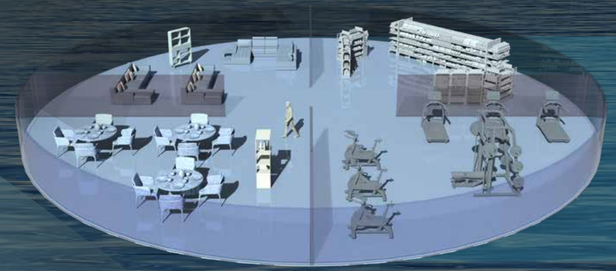


Sightseeing

Central control

Central control

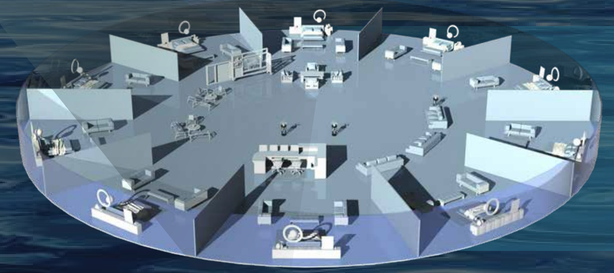
Staff work here, through the screen can observe the sea data and watch the sea situation in real time



Recreation

Recreation

Provide entertainment venues, people in this entertainment, can eat, fitness, etc., spend a happy time at sea

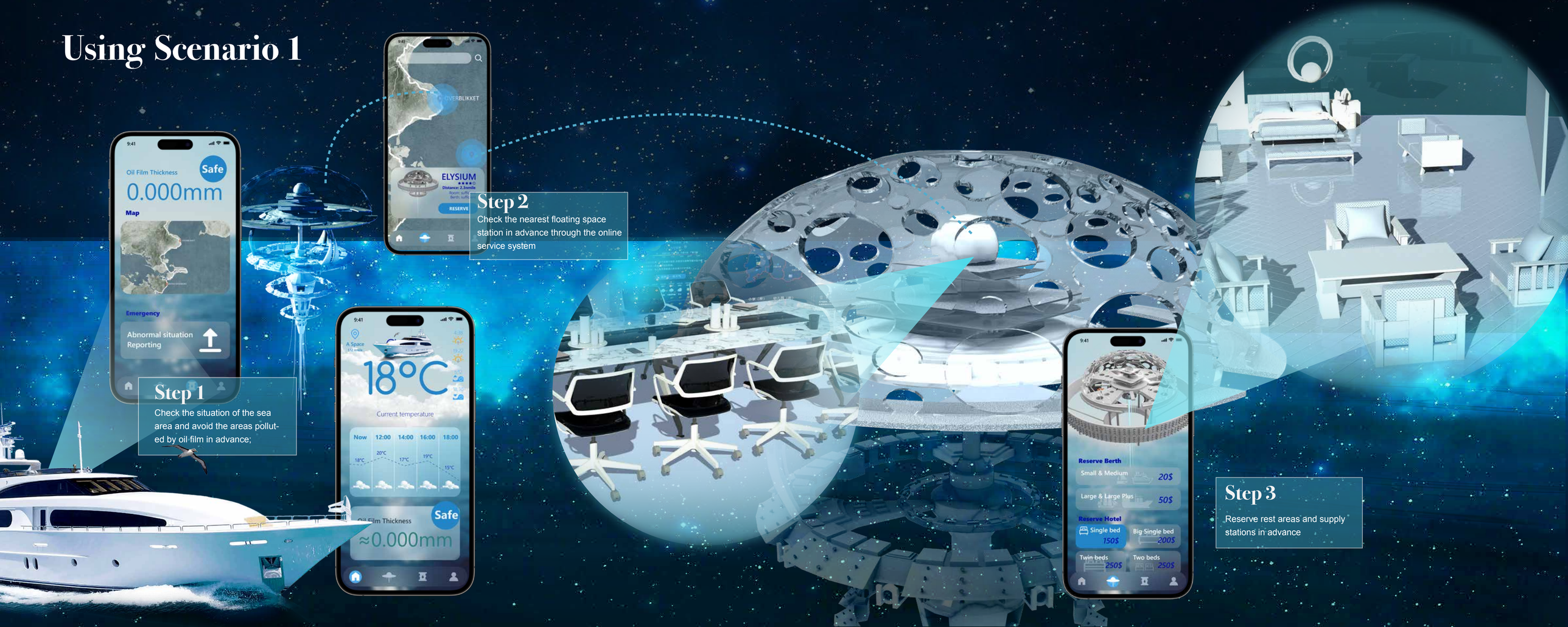


Hotel

Hotel

The sleeping area, where the hotel rooms are centrally distributed, is where everyone can have a good night

Using Scenario 1



Step 1

Check the situation of the sea area and avoid the areas polluted by oil film in advance;

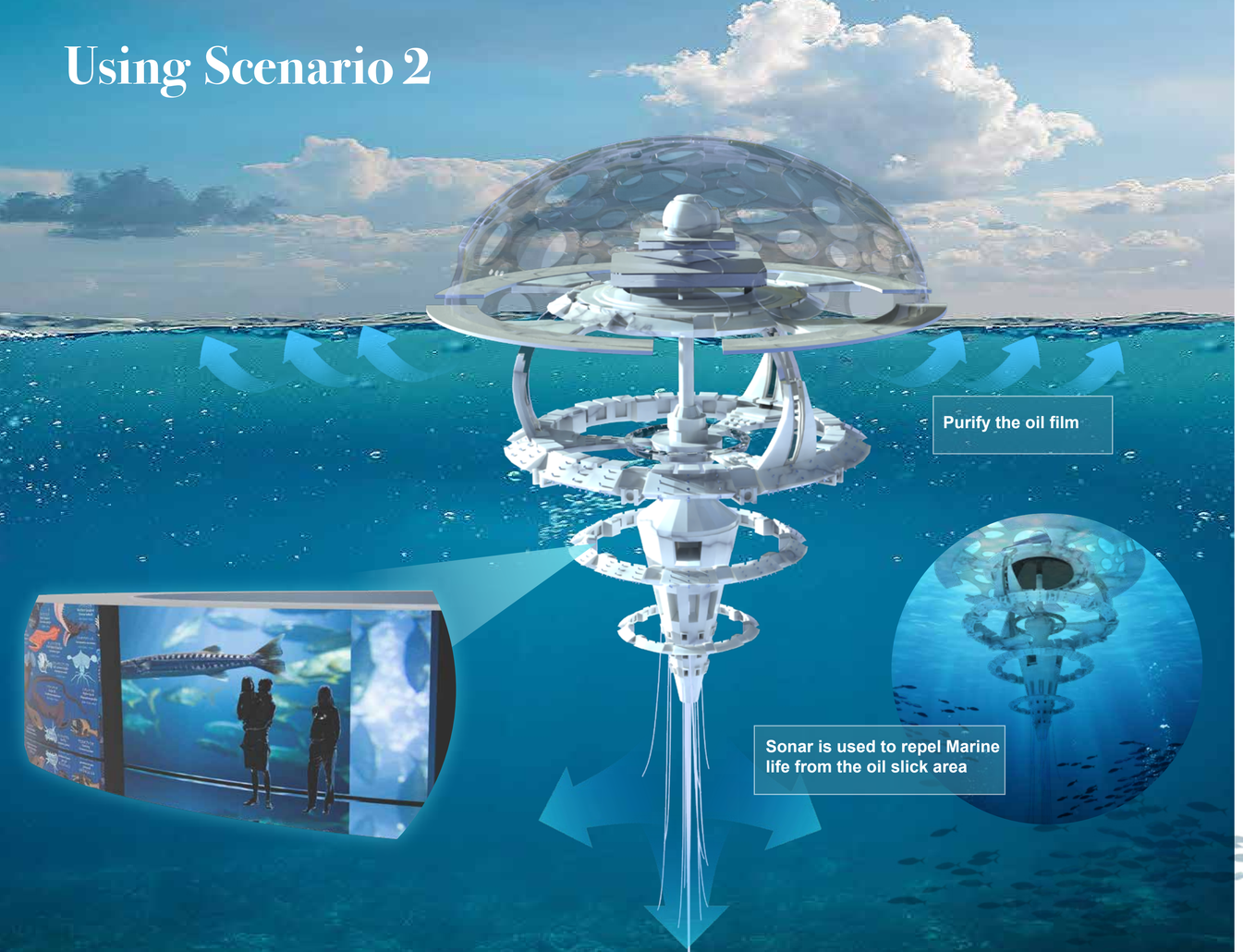
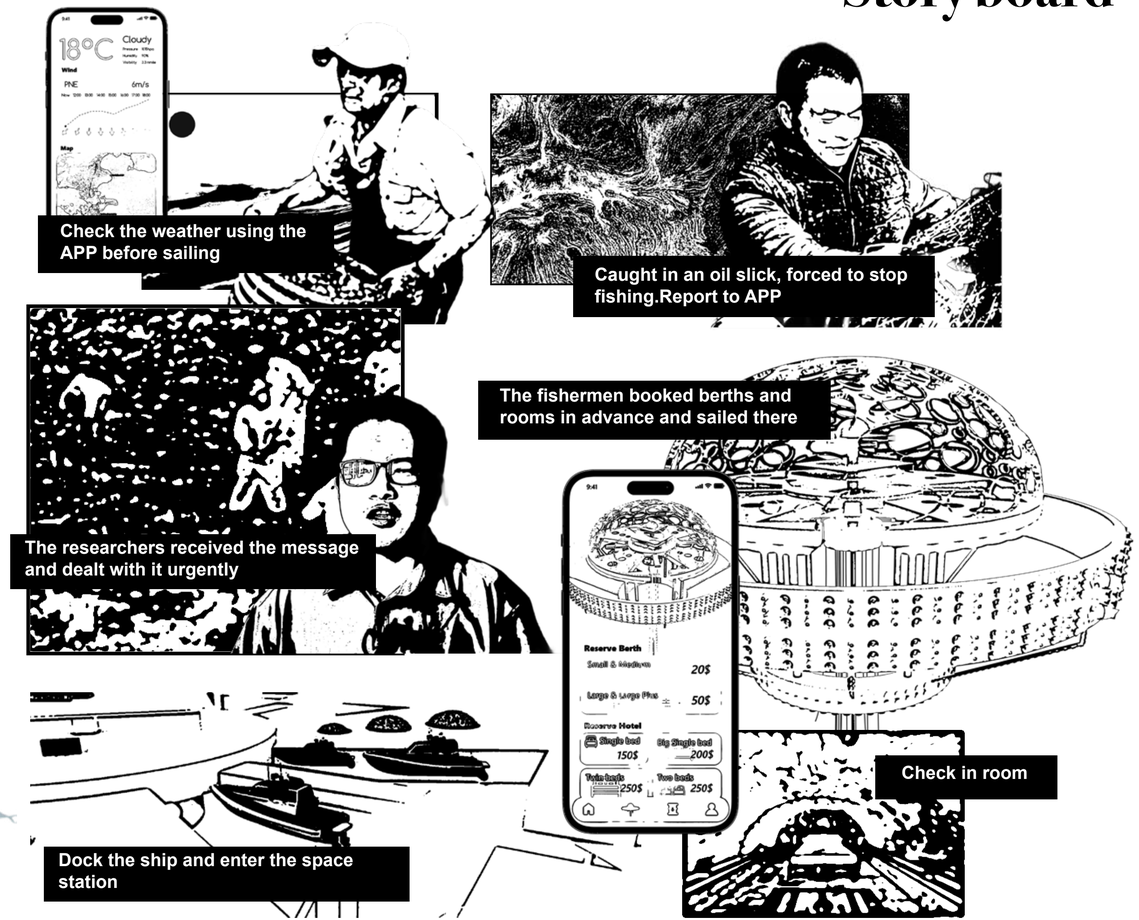
Step 2

Check the nearest floating space station in advance through the online service system

Step 3

Reserve rest areas and supply stations in advance

Using Scenario 2



Storyboard