



# Flying with you

Help to ease flying anxiety

## Smart and wearable product design

Zhijie Zhang

MSc Product Design Engineering

14/08/2022

Design tutor: Craig Whittet

Technical supervisor: Douglas Thompson

# Defining the problem

## Motivation

I am a person who is very anxious about flying. The purpose of my flying is almost for travelling, but whenever I think of flying, there is some fear in the anticipation of travelling. During the flight, any unexpected event would make my heart beat faster, even if it was actually a very slight turbulence.

I have friends around me who are in the same situation as me. So whenever we want to travel together, we avoid the option of flying in the first place. Even though it would take more events, and often cost more to travel by train, we still choose the train or other means if possible.

So this problem of anxiety about flying actually has some effects on our lives, including wasting more time on the on the road as choosing other inefficient transportation, as well as affecting our mood of anticipation for the trip.

## Background

Air travel is the most important and safe mean of transport. However, people who fear of flight avoid/ feel anxious about air travel.

**1/3**  
has some degree of fear of flying.

In 2015 there were only 92 commercial airline accidents out of **33,000,000**

**1/6**  
is unable to fly due to fear of flying.

## Symptoms

People who have aerophobia experience persistent and intense anxiety when they think about flying or when they travel by air.



Clouded Thinking



Excessive Sweating



Nausea



Gastrointestinal upset



Increased heart rate



## Opportunity

Flying in the air  $\xrightarrow{\text{lead to}}$  Sense of unknown  
Sense of insecurity

Flying anxiety is a normal emotion

However

**Excessive anxiety about air travel can lead to avoidance of flying**

- (a) Will not fly
- (b) Will fly only when absolutely necessary
- (c) Will fly when required but exhibit anxious behavior when doing so

**Fear of flying is a disorder that can be effectively treated**

# Refining the problem

## User Research

### Passenger group

Aircraft passengers are too broadly constituted, so they are first grouped by frequency.

High frequency  
(> 10 times a year)

- A very small percentage of people feel slightly anxious about flying.
- Only feel anxious when there is Turbulence(1/3).

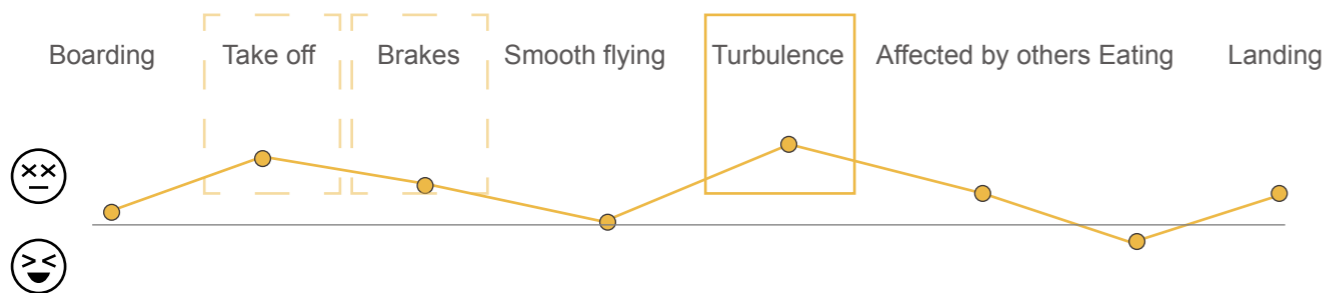
Low frequency  
(< 4 times a year)

- Most people feel anxious.
- Anxiety focused on the flight phase.

### Focus on low frequency Group

After learning that low-frequency passengers exhibited greater anxiety and last longer, I researched specific moments of anxiety by distributing a poll in an online forum.

### Journey map



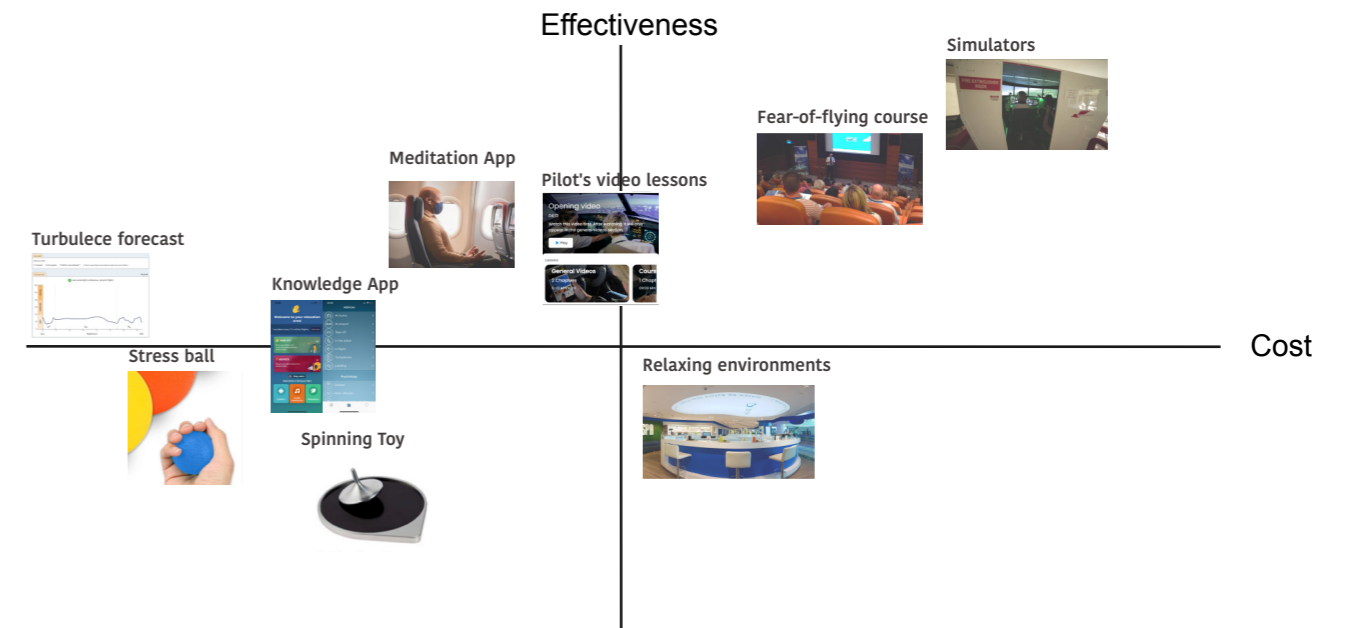
### What is helpful?

- *Distractions*
- *Explanation from flight attendants*
- *More information about the flight*
- *Calming breathing exercises*
- *Accompanied by familiar people*
- *Relaxing music*
- *Meditation*

### Behavioural habits

- Prefer to receive information in times of anxiety rather than communicating.
- Stay with friends (Be accompanied) will make them feel better.
- Expect a professional explanation about what's going on and tells them it's safe

## Market Research



There are not so many products in the market designed for easing the flying anxiety, most of which are apps/websites introducing some knowledge and coping techniques. Many airlines provide generally higher priced fearless flyer courses, made up with ground course and an 'experience flight'.

### Impact

Anxious passengers make **2/3** fewer trips than those who are not.

### Technology

Wireless technology on the aircraft is a little restricted. Bluetooth has a drawback in terms of distance, as the longest distance for working is 5 metres. Wifi is becoming commonplace and in the near future every aircraft will be able to access to wifi.

### Insight

The main source of anxiety is a sense of insecurity and the unknown. And anxiety is high in moments of bumps.

### Opportunity

Helping passengers to relieve anxiety by reducing the unknown before it occurs and giving help in moments of anxiety. It is also important to be concerned that too much information is harmful.

## During Sudden turbulence



### Psychological suggestion

An instinctive reaction, praying in heart and believing that all is well.



### Obeserve others

If other passengers behave calmly, there will be some easing effects. Conversely, if someone is acting anxious, they will also be more eanxious.



### Waiting for broadcasting

A professional's explanation of turbulence



### Can not concentrate

Anxious passengers always prepare something which can distract their attention before flight. But when they feel anxious, it is hard to concentrate these things.



### Trying to talk with others

This includes interacting with flight attendants and other passengers. Thus gaining a sense of companionship

### Overthinking

Growing fear by imagining what malfunction the plane has encountered to cause such turbulence.



# User and Product Requirements

## PERSONAS



### Lina

**Age:** 28 Years old

**Living condition:** Live alone.

**Employment Situation:** employed in another city

#### Travel preference:

Prefer to choose other transportation than by air.

Need to fly home alone.

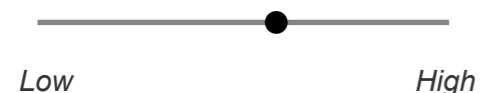
Usually choose economy class.

#### Frequency of Travel by Air:



#### Anxiety level:

Will fly when necessary but exhibit anxious behavior when doing so.



## PRODUCT REQUIREMENTS

### Features

1/Provide more information and knowledge about flight during the flying.

2/Calm passengers down when they are detected anxiety.

### Target time

Mostly focus on Turbulence

### Image

1/Show some Easyjet brand visual characteristics as it is designed to brand with Easyjet Airline.

2/Comfortable to use.

### Learnability

Easy to use/Instinctly for passengers

### Functions

1/Give information about some condition during flights

2/Guide users to focus on the breath when they are anxious

3/Live chat with other passengers

4/Detect the heart rate of users

### Emotion

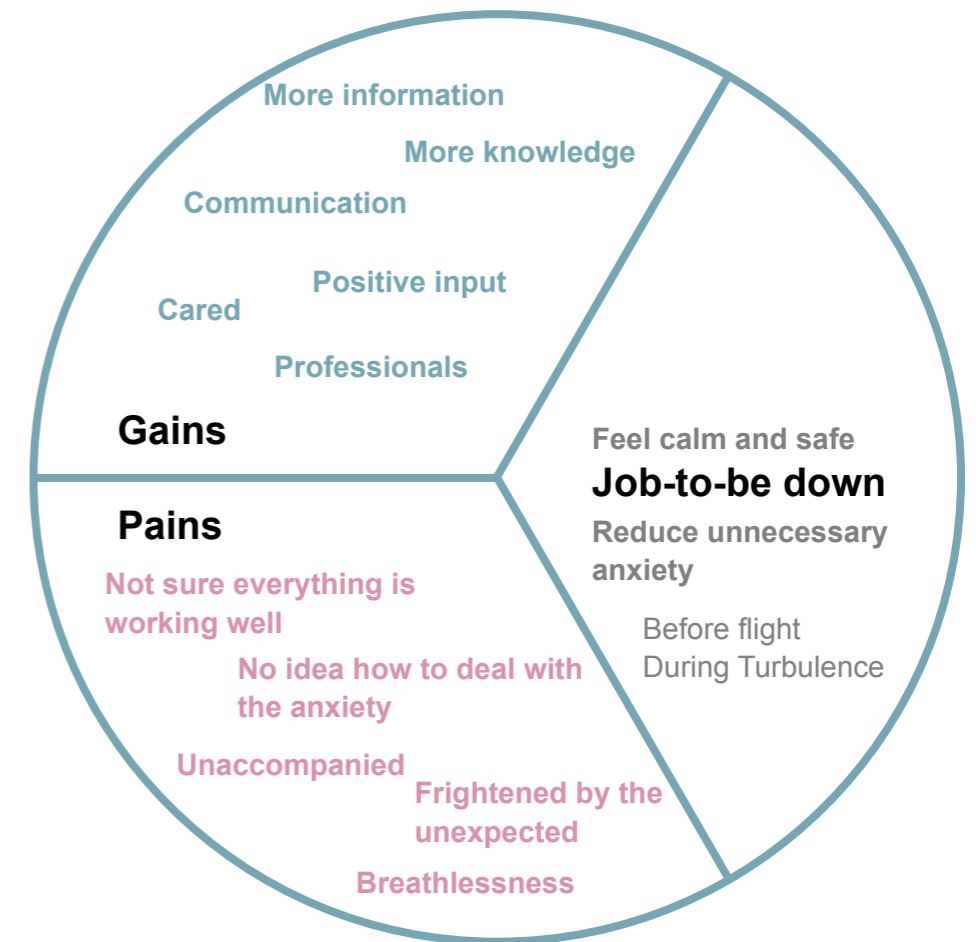
1/Sense of being accompanied

2/Reducing the sense of the unknown

3/Interactive and Visualized

### Cost

Control cost to under 10 pounds and the lower the better.



## Technology



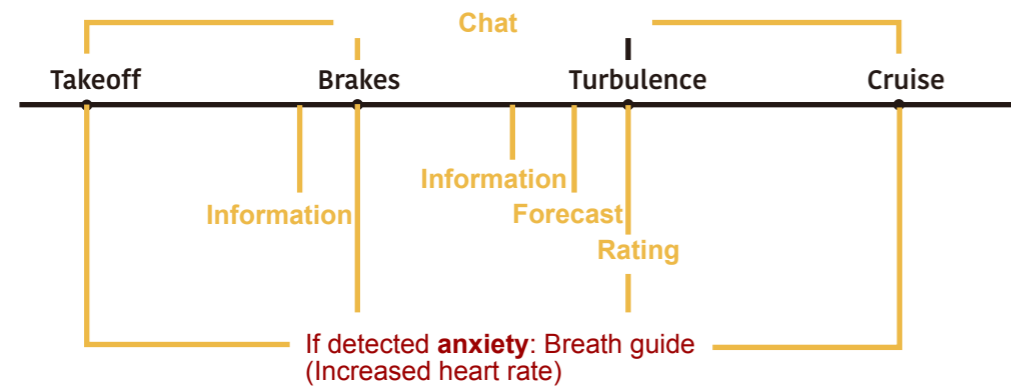
Detect heart rate



Wifi and data on flights

Real-time turbulence map  
location of the plane

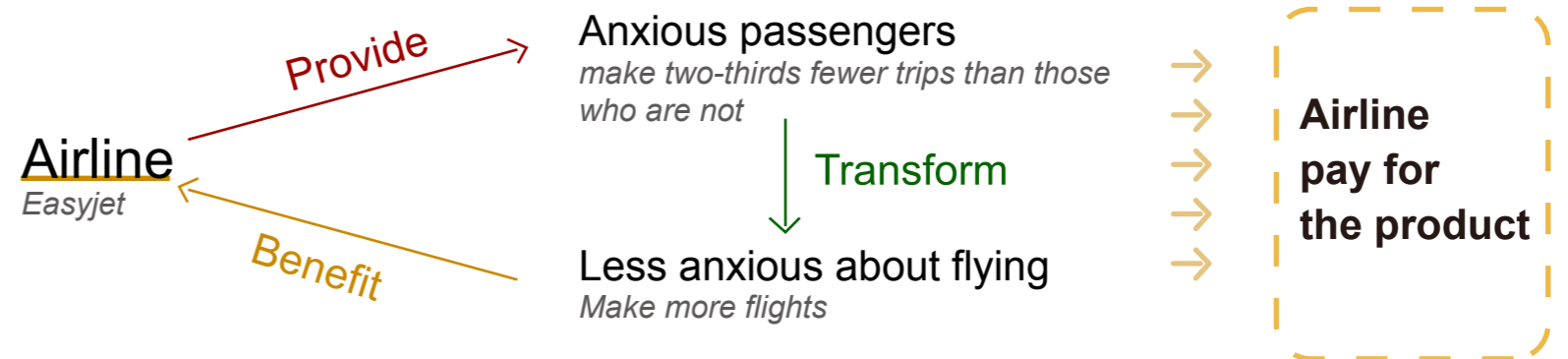
## Time point of functions



### Functions

- (a) Turbulence forecast & ranking
- (b) Information for scenarios that may occur in specific time point
- (c) Heart rate detect and breath guide
- (d) Chat with others

## Stakeholders

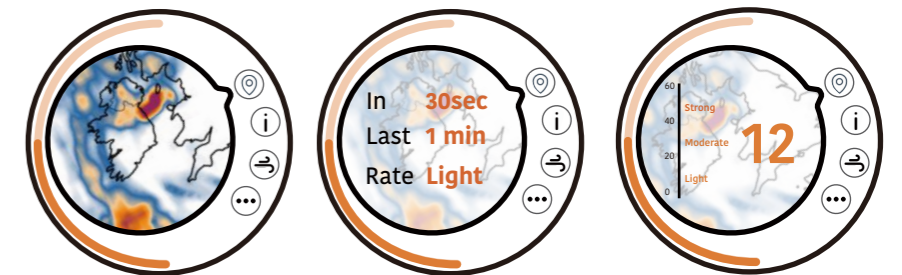


## Interface design



Map

Forecast the timing and extent of turbulence before they occur by aircraft positioning and real-time turbulence maps, and rank safety level during the turbulence.



Information

Give more visual information for scenarios that may occur in specific time point when users feel strong anxiety. For example, before turbulence and brakes.



Chat

Provide an entry for communication with other passengers on the aircraft. After matching, passengers can scan to chat.

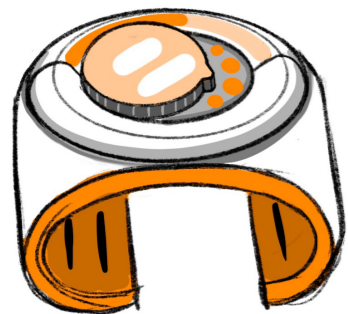


Breath Guide

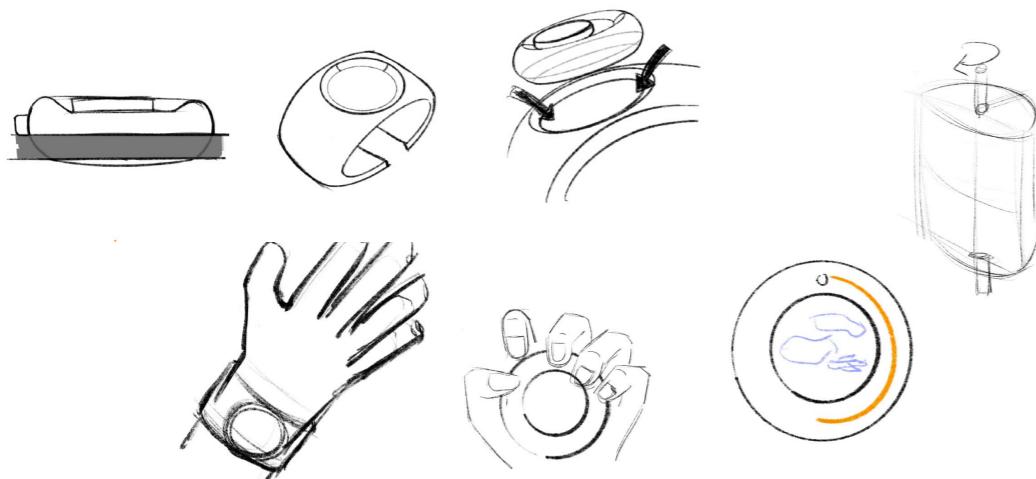
Keep detecting user's heart rate while being worn and guide breath through physical variation when detecting anxiety (increased heart rate). With 4-4-4 breathing technique.



## Sketches



Brand with Easyjet  
1/Show Easyjet brand visual characteristics



# Prototype

## 1 Test the shape for comfortable grip

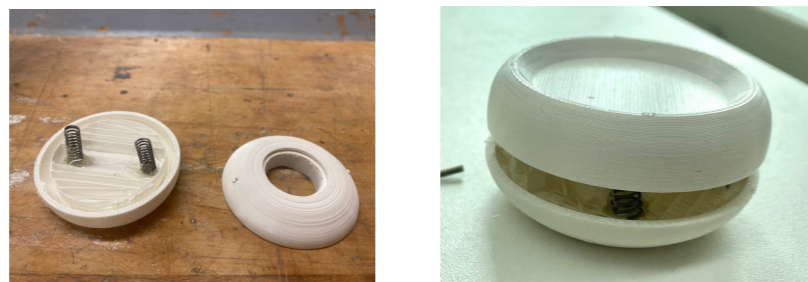
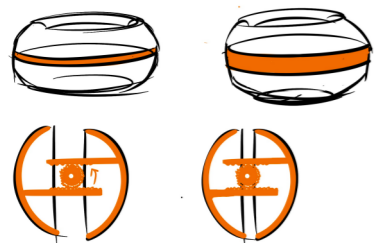


Ten users with different hand lengths ranging from 170- 190mm were invited to test the grip.

8 out of 10 person choose pebble shape as the most comfortable one.

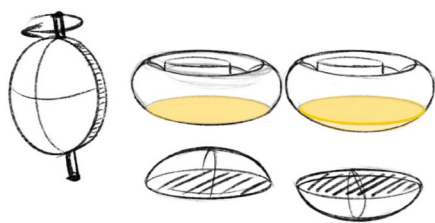
## 2 Test the method of variation for guiding breath

(a) Longitudinal expansion and contraction with gear transmission inside.



✗ Uncomfortable as the hands will be driven to vary.

(b) Pressure on the palm through the rotation of the bottom hemisphere.



✓ Tighter grip when anxious, this can also bring noticeable sensations when gripping tightly

Silicone layer attached

## 3 Test grip section with prototype



### Feedback

- ✓ The size grip is appropriate
- ✗ 1/ The upper part is not rounded enough, not comfortable as fingers have little support on top .
- 2/ Because icons are tilted, they are not very clear to see.
- 3/ Rotating knob is a little difficult because of the small contact surface with the finger.
- 4/ The bottom rotation object is a little small, so the rotation is not strongly felt.



## 4 Improved prototype



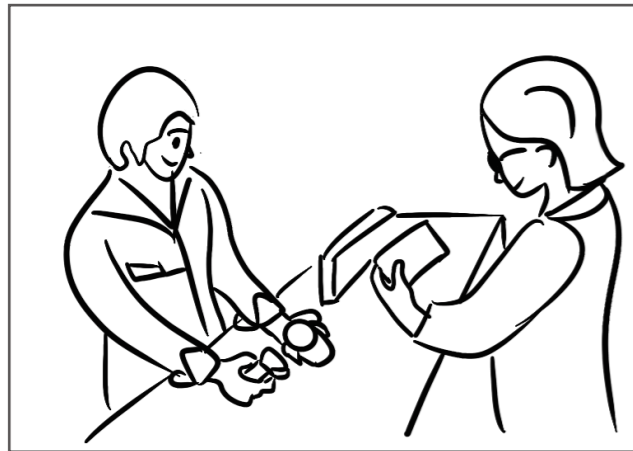
### Improvements

- 1/The upper part is more rounded and the flat area is increased to give more support to the fingers.
- 2/ Buttons are no longer placed at an angle.
- 3/The knob is more easily pushed by the finger by adding an assist.
- 4/The radius of the rotation object is increased.

# User Journey

## 1 Collect before boarding

Passengers need to borrow online before flight.



## 2 Scan to match product and passenger

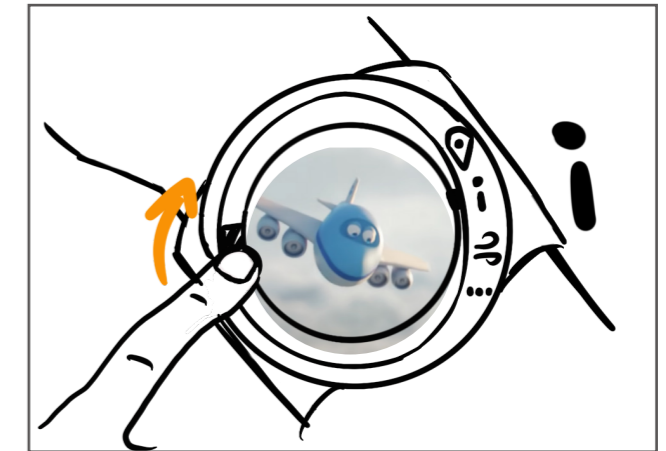


## 3 Wear on hand



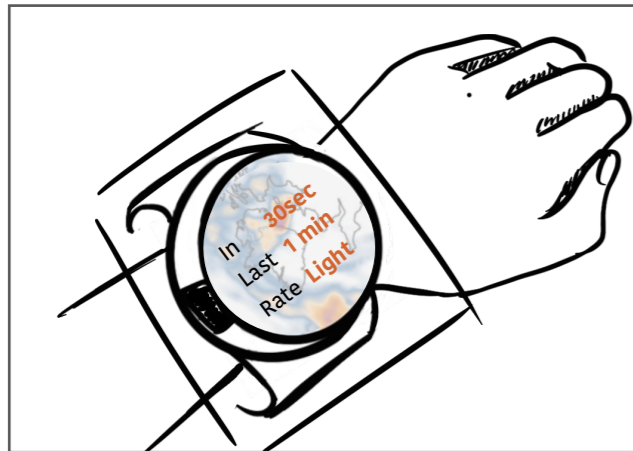
## 4 When Climbling

Give information about turbulence visually



## 5 Forecast the turbulence

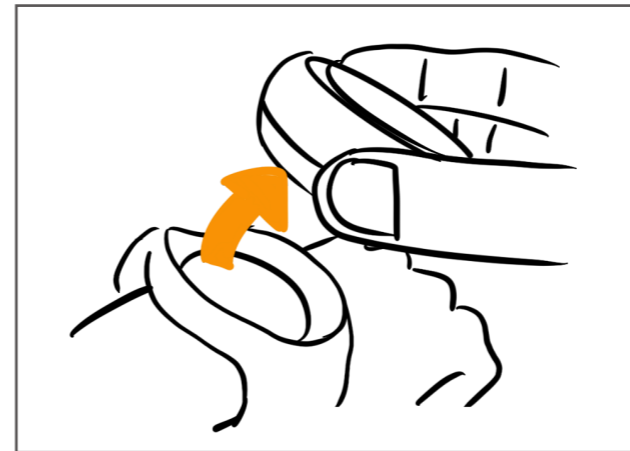
Forecast the turbulence duration and intensity



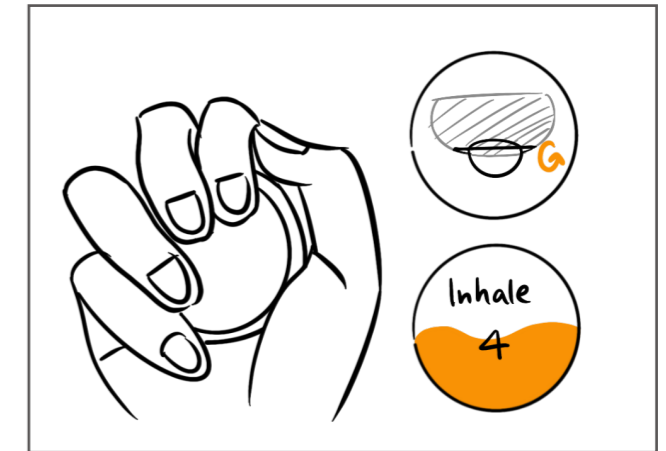
## 6 Detect the increasing heart rate (Passengers' anxiety)



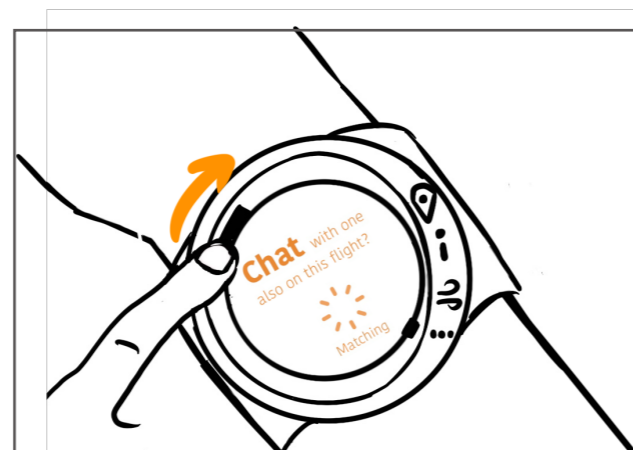
## 7 Take off the upper part



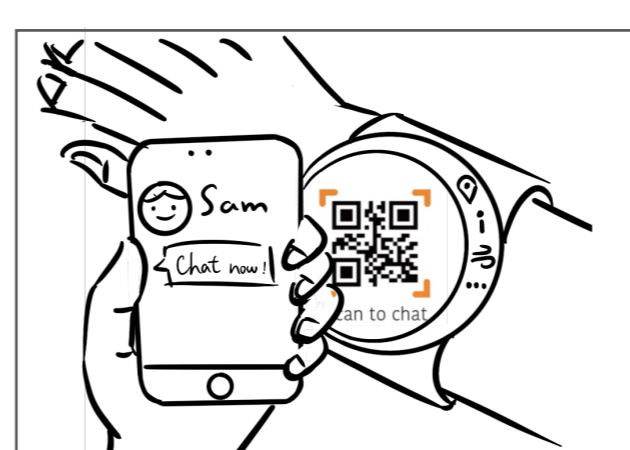
## 8 Guide breath both physically and visually



## 9 Chat with other passengers



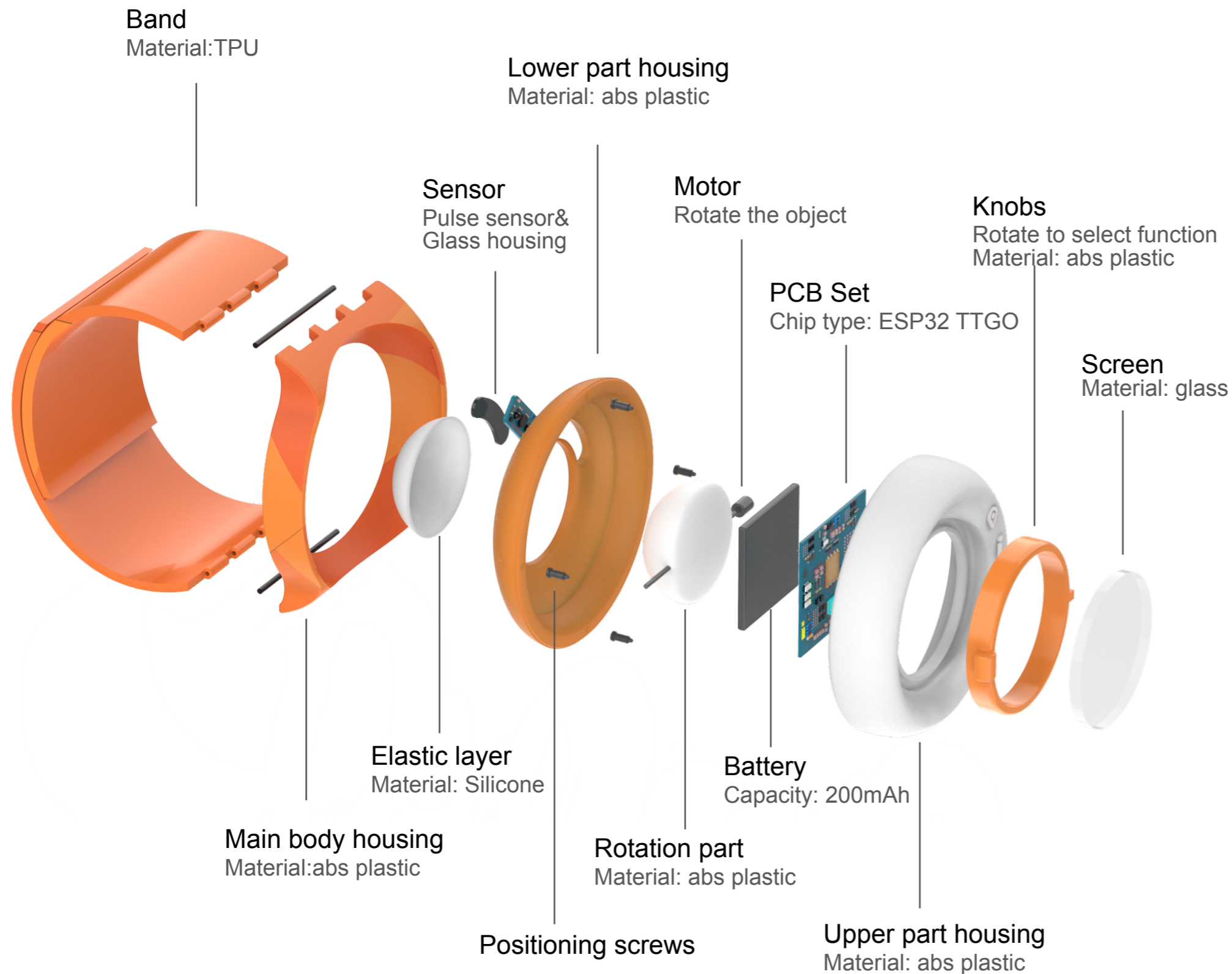
## 10 After matching, scan his/her QR code to chat





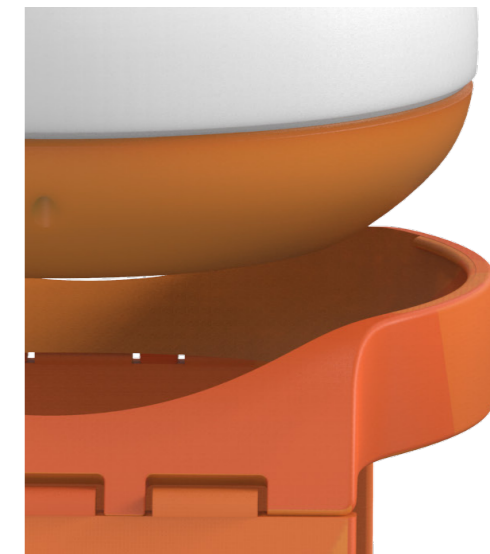
# Final design

## Exploded View



## Details

Locking method:  
Through matching the recess in the main body and protrusion on the housing.



## Power

The battery capacity is 200mAh.

Because the rotation of the internal object during guided breathing requires a motor a motor to drive, it can be a relatively large energy drain.

After calculation, the battery can make it rotating continuously for **half an hour**.

The good thing is that this function will not be used all the time. So this product needs to be charged frequently.

## User volume

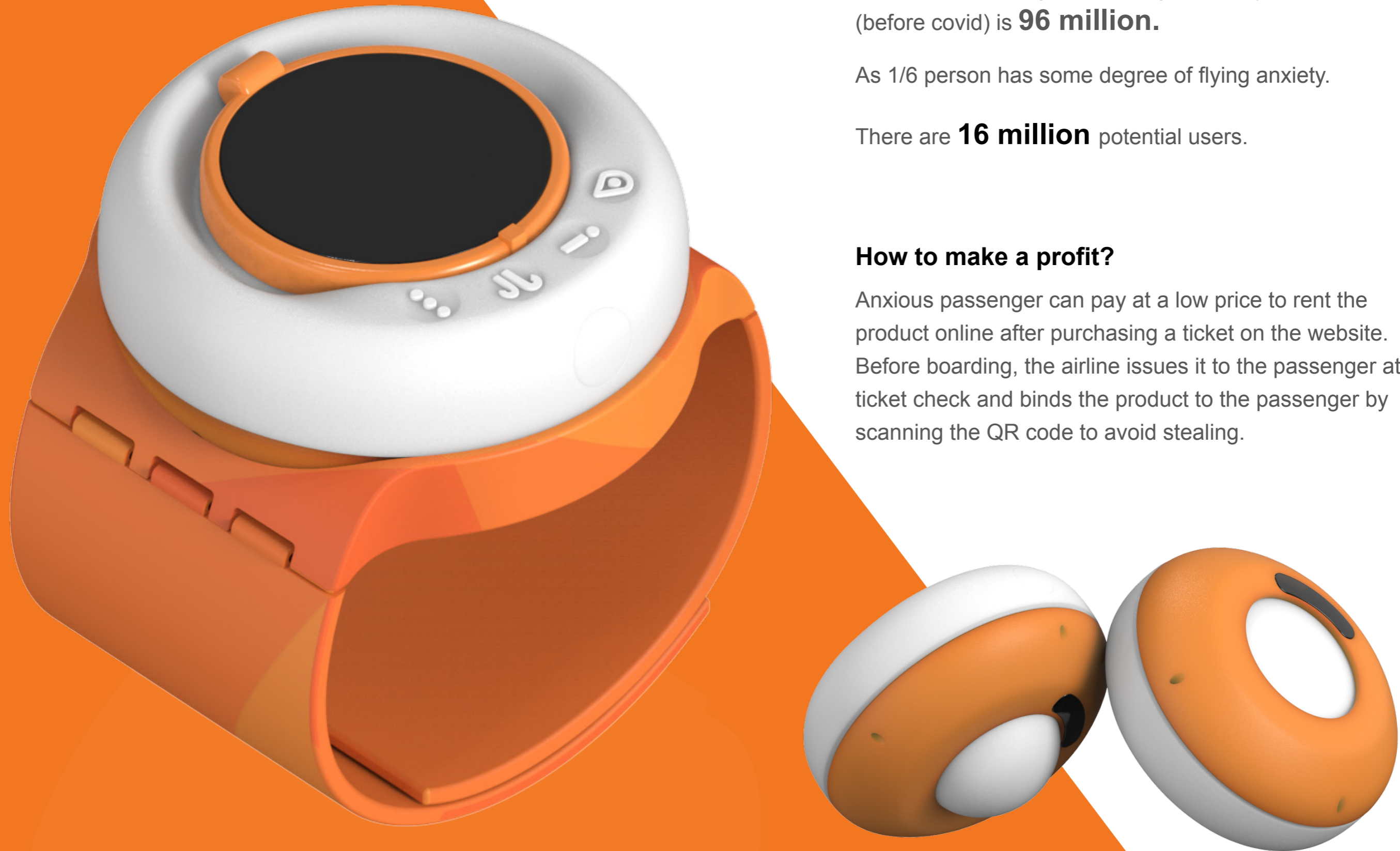
Number of passengers traveling with easyJet in 2019 (before covid) is **96 million**.

As 1/6 person has some degree of flying anxiety.

There are **16 million** potential users.

## How to make a profit?

Anxious passenger can pay at a low price to rent the product online after purchasing a ticket on the website. Before boarding, the airline issues it to the passenger at ticket check and binds the product to the passenger by scanning the QR code to avoid stealing.



# Reflective summary

After researching, ideation, developing and testing, the solution can be considered achieved the aims of the project. The product is designed to ease flight anxiety by providing more aircraft knowledge, more information, a sense of companionship, less unknowns and breathing instructions in a number of ways. The materials and components has been chosen with a view to reducing costs and ensuring that the product can be purchased in large numbers by airlines at a low cost. User comfort was also tested to ensure that the product was comfortable for users of all sizes of hands to grip.

I learnt a lot from this product design. In previous product design processes, little thought was given to technical implementation and the focus was on good looking renderings. In this design, the design was initially designed to leave the technical aspects aside, but when the technical implementation was considered later, the original design was modified more for the sake of technical implementation, and some designs were abandoned for the sake of aesthetics that made the process more complicated and costly.

There are still some shortcomings in this design. Firstly, I am not very familiar with circuitry and this is a product that relies heavily on circuitry. I have only managed to describe the functions of the circuit in this report using flowcharts, and I hope to be able to use Arduino for these functions in my future work. Again, it was difficult to get a real evaluation on user testing because no model with real functionality was made. This is all future work for me.

# References

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