EARTH SURFERS

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1 introduction

context

Nowadays, medicine is advancing in many areas and the treatment of different diseases is being improved constantly. However, diseases like Duchenne muscular dystrophy have no prospect of full recovery in the near future. The disease primarily affects boys between 4-26, damaging legs and arms movement. Many people with Duchenne participate in a medical research which is the key for exploring the disease and finding a way to prevent it or make it slower. Unfortunately, there is no short term gratification for taking part in the research. We as a team want to change this working together with Design studio Ann.ID, Yumen Bionics and and Samenwerkende Spierfondsen and reward the participants by translating the collected data during medical research in a way that it adds value to their daily life.

problem statement

Teen boys with Duchenne aged between 12-14 already experience behavioural changes and difficulties stepping into adulthood, while also growing increasingly aware of their condition, resulting in feelings of anxiety and frustration. Participating in research without immediate incentive only worsens the situation.

vision

Our aim is to help children with muscular disorders adjust and focus on the present by giving them a playful way of interacting with the collected medical data.

design goal

Our goal is to create an immediate incentive in the form of a product for 12-14 year olds with Duchenne that will provide a playful interaction with the medical data from research. We want to create a product with a sense of progression so that the user will want to come back to it. This product should draw attention towards the users daily life and should be something that has a broad appeal. The user needs to be able to interact with it without assistance and it should give him a sense of control.

1. 2. 3. 4. 5. 6. 7.

Ctrl
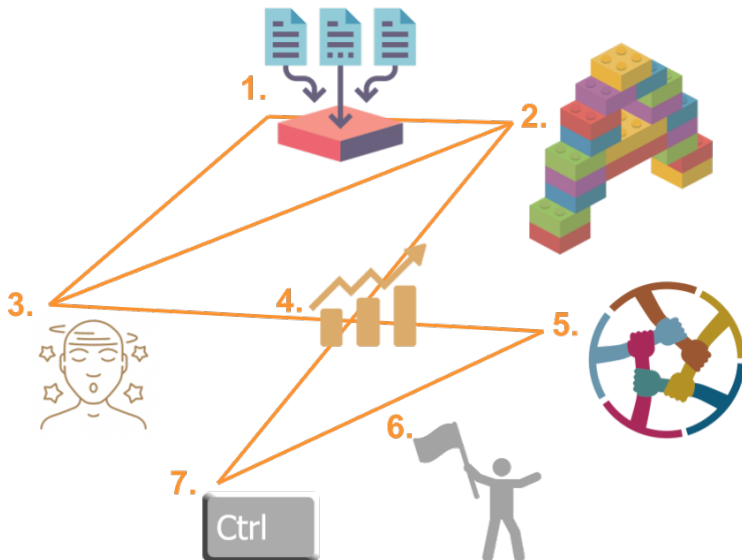
② personas

Charlie ,13

Charlie has Duchenne. He has difficulties doing some tasks and always has his mom or caretaker by his side. As he grows older he becomes more aware of his medical condition and the illness progression often discourages him.

Charlie's mom Alice, 40

Alice's world was turned upside down, when she found out her child has Duchenne. Although the feeling of injustice can sometimes be overwhelming, she stays strong for her family and for her child.

Charlie's sister Angela, 10

While Angela understands the family dynamics and love her brother Charlie, she sometimes wishes her parents had more time for her.
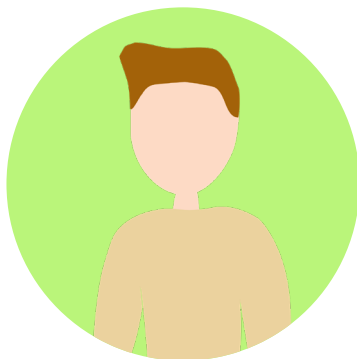
Charlie's caretaker Bryce, 32

Tom finds his job rewarding and he has a close connection with Charlie. However it can sometimes be challenging.

3 personas

Interaction
Clear connection between EMG and product, without directly showing data.

Progression
There a skill curve to the game.

Independence
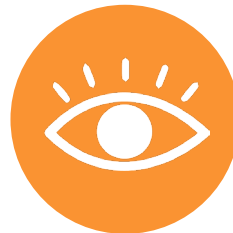It can be used completely by our target group without any assistance

Inclusion
It can be used by Duchenne patients, patients with other dystrophies, or people with no dystrophies.

Control
There are multiple choices that the user can make that affect gameplay.

Distraction
The product does not put any emphasis on the muscle weakness progression.
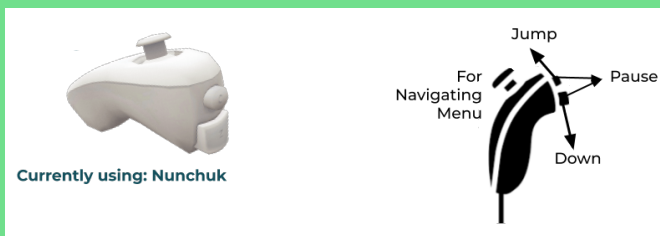
4 game analysis

starting points

Based on our research, children to teens will spend an average of 11 hours online. One research concluded that patients thoroughly enjoy interacting with games that combines casual health activities with serious gaming elements. They concluded that there is a high potential in the market for games that initiates and allows further discussions about their users' illnesses. With this knowledge, we decided to develop a game for our Duchenne users that connects them to the data they collect while participating for the research study.

In an interview with our client, it was explained that although our users are affected with Duchenne, they still have similar interests as other people their age, many also having an affinity for video games. It was emphasized that our game should solely focus on the user's independence, and prevent from making the product focus on their illness. Many popular games today also have a socialization factor, that these games allows their users to game together and create friendships. We took all of the information above into account during our ideation and development of our game.

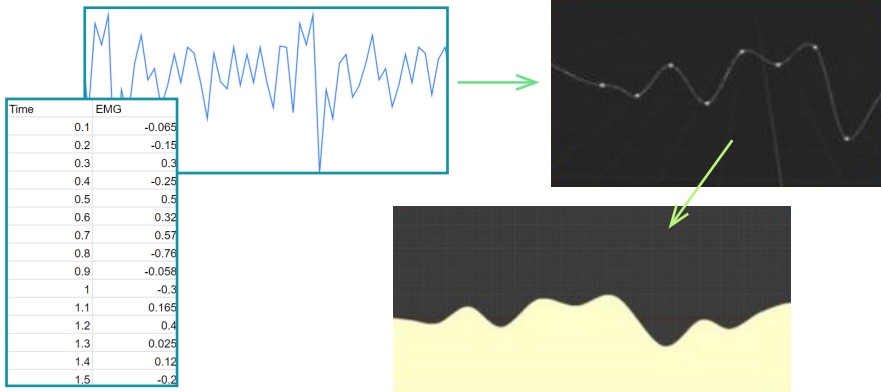## game mechanics

customizable controls

The game needs to have an editable control scheme to accommodate different types of controllers and as such the game will have the ability to have different control schemes.

Currently using: Nunchuk

Jump
For Navigating Menu
Pause
Down

game mechanics

EMG data

EMG Data is turned into the landscape for the game.

Time	EMG
0.1	-0.065
0.2	-0.15
0.3	0.3
0.4	-0.25
0.5	0.5
0.6	0.32
0.7	0.57
0.8	-0.76
0.9	-0.058
1	-0.3
1.1	0.165
1.2	0.4
1.3	0.025
1.4	0.12
1.5	-0.2

game components

● We wanted a series of distinct characters that the player could choose from as a way of personalising the game.

● An array of different enemies create some visual diversity and provide unique challenges and interactions.

● Static obstacles add to the visual complexity whilst making navigating the levels more interesting.

● The player can collect coins in as a way of providing a reward. These coins can then be traded for different cosmetic options like characters.

● The characters health is displayed at the top of the screen to give an indication of how careful the player should be, we chose to have zzzz represent this as we wanted the player to be asleep and the game end when he wakes up.
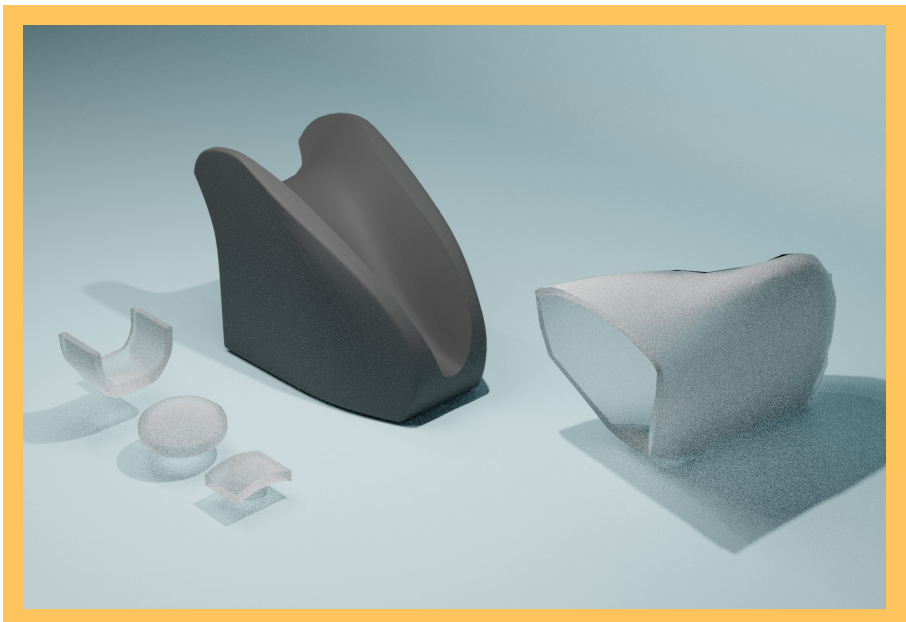
5 controller analysis

In addition to our game, the users will need a game controller in order to properly play our game. Most controllers that are already in the market are not accessible for disabled users. However, some companies are starting to pay attention to this user group. More companies are incorporating custom controls in their gaming software, where users can customize their controller buttons to their desires in order to meet their restrictions, while some are modifying and redesigning their existing controller so it is more accessible for the users.

Considering the control needs of our game, we expect that the users will need a maximum of two buttons and a joystick. This results in the selection of utilizing the *One-Handed Joystick* from the *XBox Adaptive Controller* set. Knowing our users' movement restrictions, we have also designed a set of controller accessories in order to maximise the accessibility comfortability of the controller for the user.
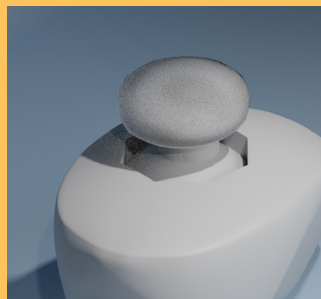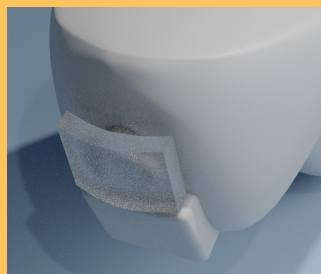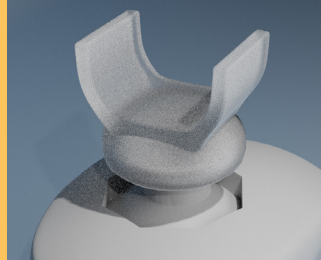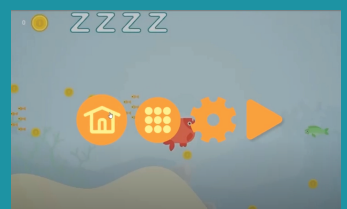
stand holder for the controller

silicone grip sleeve

joystick button caps

6 in use

EARTH SURFERS

LEVELS EMG LEVELS

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15

SELECT WORLD

SELECT CHARACTER

English

Sync EMG

SELECT SECTION OF EMG TO PLAY

EMG LEVELS DEFAULT LEVELS

master

EASY	MEDIUM	HARD
EASY	MEDIUM	HARD
EASY	MEDIUM	HARD
EASY	MEDIUM	HARD

beginner

ZZZZ

ZZZZ
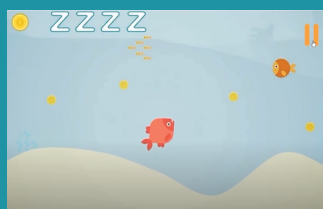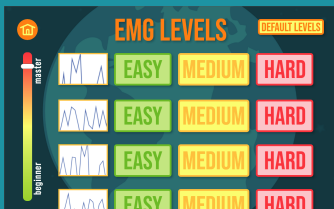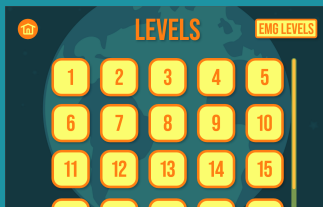
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KADO

"Because everyday
is a gift"