CONCEPT PRESENTATION

DECO2200 - ASSESSMENT 2

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Problem with Space Travels: Mid-Flight

- 2+ hours of exercise in space
- Crucial health risk due to microgravity environment: **muscle and bone health**
- Microgravity: significant decrease of muscle and bone exercises
- Some of the diseases that can occur :
    - Atrophy (muscle loss)
    - Bone weakening
    - Osteoporosis

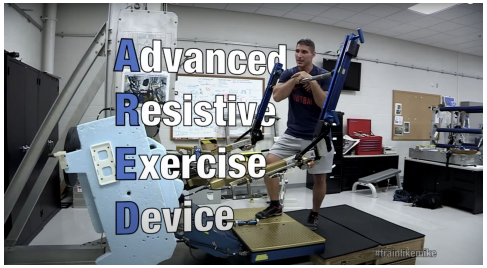
(*How astronauts exercise in microgravity*, 2020)

Current Problems with Fitness in Space

The workout machines used in space are ARED, CEVIS, and COLBERT. All of these exercise machines use a harness to apply pressure.

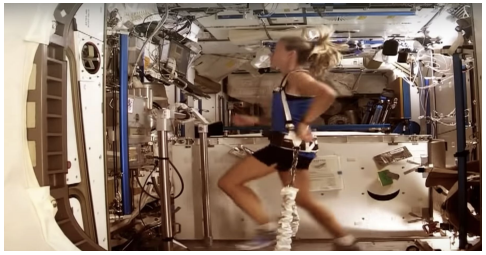
Problems that astronauts have experienced

- Karen Nyberg mentioned how running on the space treadmill machine isn't as good as running on earth.
- When using the machines, astronauts can't move around freely since they are strapped down in a harness. This makes it difficult to reach out to the screen in order to navigate through the interface.



(*Train Like an Astronaut -- ARED*, 2020)

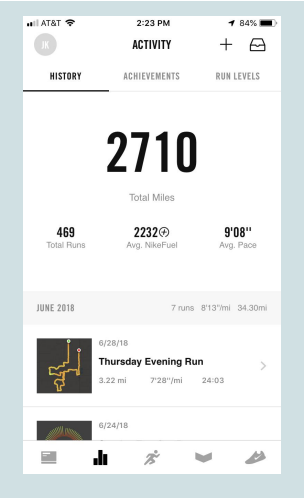
(*Cycling on the International Space Station With Astronaut Doug Wheelock*, 2020)



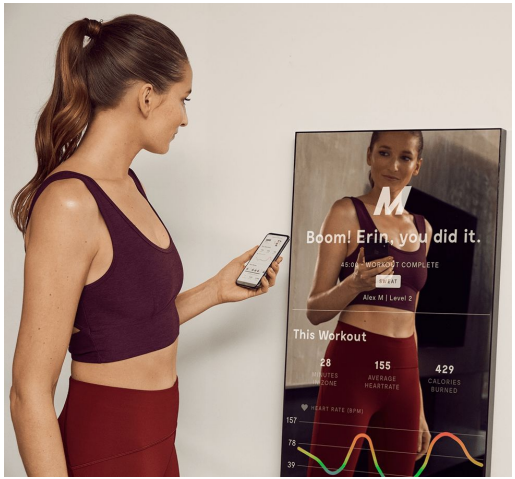
(*How do Astronauts Exercise in Zero Gravity?*, 2020)

Current Problems with Existing Technologies for Fitness

- **Existing fitness apps lack in creating progressively improving workout results**
- **Workout devices that have separate control units make it cumbersome to use**
- **Fitness games can easily become boring**



(*Nike Training Club App*, 2020)



(*Fitness Mirror*, 2020)

(*Garmin Game App*, 2020)

Solutions

Fitness in Space

- Karen Nyberg mentioned how running on the space treadmill machine isn't as good as running on earth.
    - **Make the experience of working out in space feel more than just another routine of the day**
- When using the machines, astronauts are strapped with a harness to apply pressure and prevent themselves from floating around.
- Astronauts have to reach out to the screen in order to navigate through the interface.
    - **Allow the user to navigate through the screen without having to unstrap themselves from the harness**

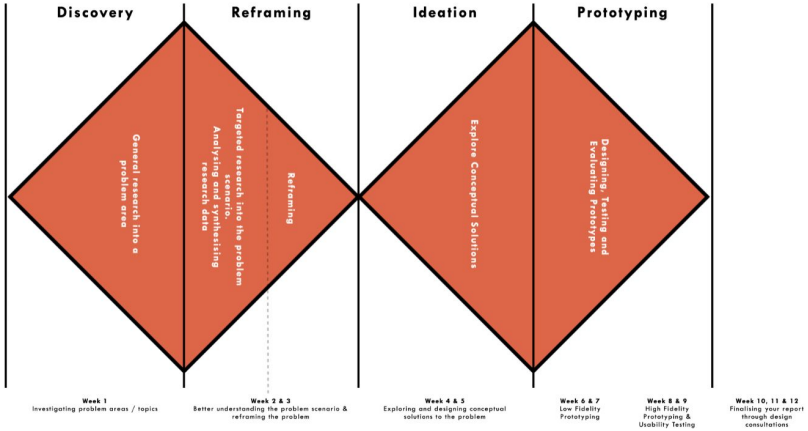
Existing Fitness Technologies

- Existing fitness apps lack in creating progressively improving workout results
    - **Update the user with the latest workout to make their workout challenging**
- Workout devices that have separate control units make it cumbersome to use
    - **Design a device that makes screen navigation more convenient considering the limitation in mobility in microgravity**
- Fitness games can easily become boring
    - **Create an interface that is highly interactive with the user's workout performance in real-time**
    - **Lead the user to focus on their health rather than the game itself**

Design Process

To find the right solution for the problems we discovered, we use the double diamond diagram introduced in the lecture to guide us through our design process ("Week 4 - Ideation – Exploring Opportunities", 2020).

- Discovery
  - Research (done in A1)
- Reframing
  - Synthesize research into data
- Ideation
  - Explore conceptual solutions
- Prototyping
  - Design solutions
  - Test solutions
  - Evaluate solutions



("Week 4 - Ideation – Exploring Opportunities", 2020)

CONCEPTS

1

Virtual Reality Exercise Device

Problem:

- Lower satisfaction of exercise experience compared to the traditional way of exercising on earth
- The struggle to adjust pressure loads manually.

Solution:

- Create a virtual environment for the user—one that is similar to earth
- A exoskeleton suit that supplies resistance against leg movement

2

SMART Goal Holographic Screen

Problem:

- Difficulty with adapting to working out in microgravity
- Number of machines may be limited

Solution:

- Creating a system that provides users with the right level of challenge according to their current capabilities
- Incorporate an element of competitiveness to keep users motivated

3

Virtual Pet Raising Game

Problem:

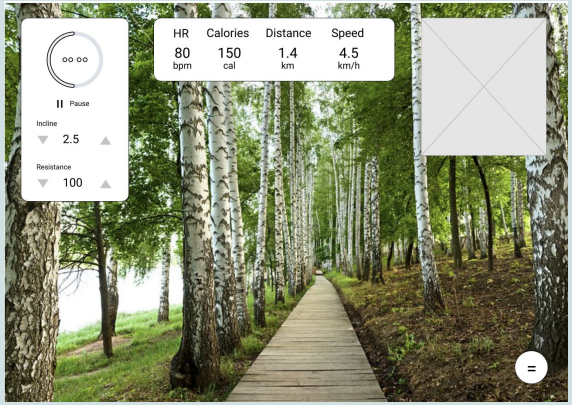
- Unattainable workout goal for non-fitness people
- Games that can get boring

Solution:

- Keep users mindful of their health status rather than trying to reach a goal
- Ludic game that has no end goal but encourage exploration and discovery of their muscle and bone health

Concept 1

Virtual Reality Exercise Device



FULLY ARTIFICIAL ENVIRONMENT

WORKS WITH EXOSKELETON MACHINE

(*NASA's Ironman-Like Exoskeleton Could Give Astronauts, Paraplegics Improved Mobility and Strength*, 2013)

(*Netflix Show Black Mirror Pushes Boundaries Of Virtual Reality*, 2019)

REAL-TIME HAND TRACKING

Concept 1

Virtual Reality Exercise Device

- VR head-mounted display that is used in combination with an exoskeleton machine
- The device would be used when the user is exercising on a treadmill/ on a bike
- Cardio-based exercise
- The exoskeleton machine works by **supplying resistance** against the leg movement

Why Virtual Reality?

- VR is a great tool to simulate an artificial environment according to the user's needs
- It also helps to keep the user **motivated** as it makes the exercise more **engaging** (capturing the user's attention through 360 view)

How the user would interact

- Hand recognition technology / hand tracking

(*Oculus Quest Hand Tracking Is HERE*, 2020)

(*Oculus Quest Hand Tracking VR*, 2020)

Concept Sketches

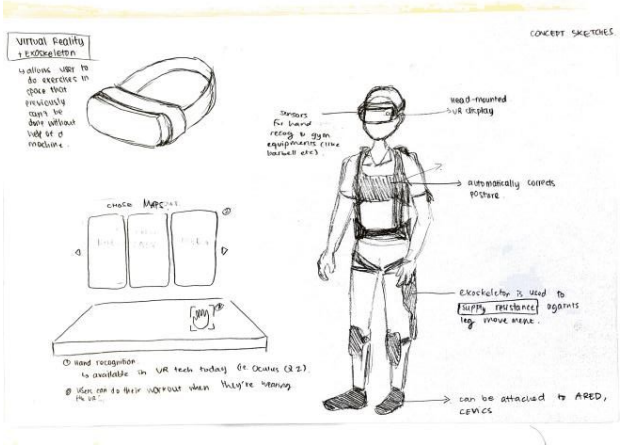
Features

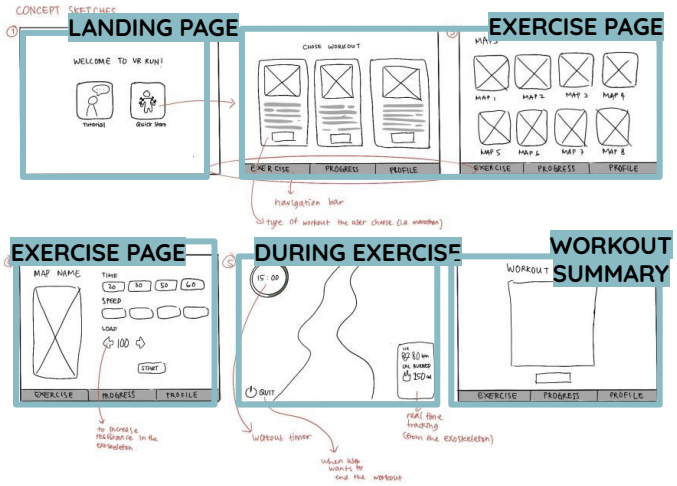
The features the VR interface would include:

- Map recommendations based on the user's preference
- Automatically increase resistance in the exoskeleton suit
- See daily and weekly progress
- Real-time health monitoring during exercise (i.e. heart rate, calories burned, etc)

This device is aimed to solve these problems:

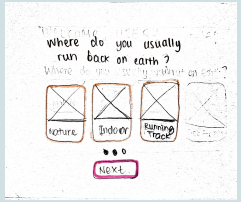
- Lower satisfaction of exercise experience compared to the traditional way of exercising on earth
- The struggle of adjusting pressure loads manually

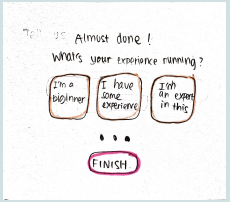




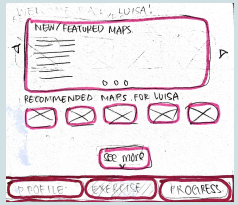
User Testing

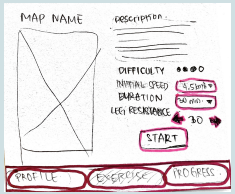
Landing page (when user first interact with the VR)



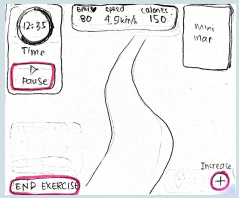


Exercise page





Interface during the exercise



Main insights :

- Most users are **not** confused with the interface. They quickly noticed where elements are located.
- In the exercise section where the maps are shown, they found the **recommended maps to be helpful** in figuring out which map to use when they first start using the device.
- However, for a long term and frequent use, they wanted something **more personalised** such as a “liked maps” section to easily access their most often used map.
- During the exercise, the user felt like the **interface on the sides was too big** and distracting.

REDESIGN

PROBLEM #1

The questions in the landing page are ambiguous and make the user feel confused.

SOLUTION #1

- The question “Where do you usually run back on earth?” is rephrased to “Which are your maps preference?”
- A preview of the VR world as the user clicks the button to make the user understand the consequences of their choices

PROBLEM #2

Users want a more personalised interface for long term and frequent use

SOLUTION #2

- Adding a section for liked maps in the exercising page

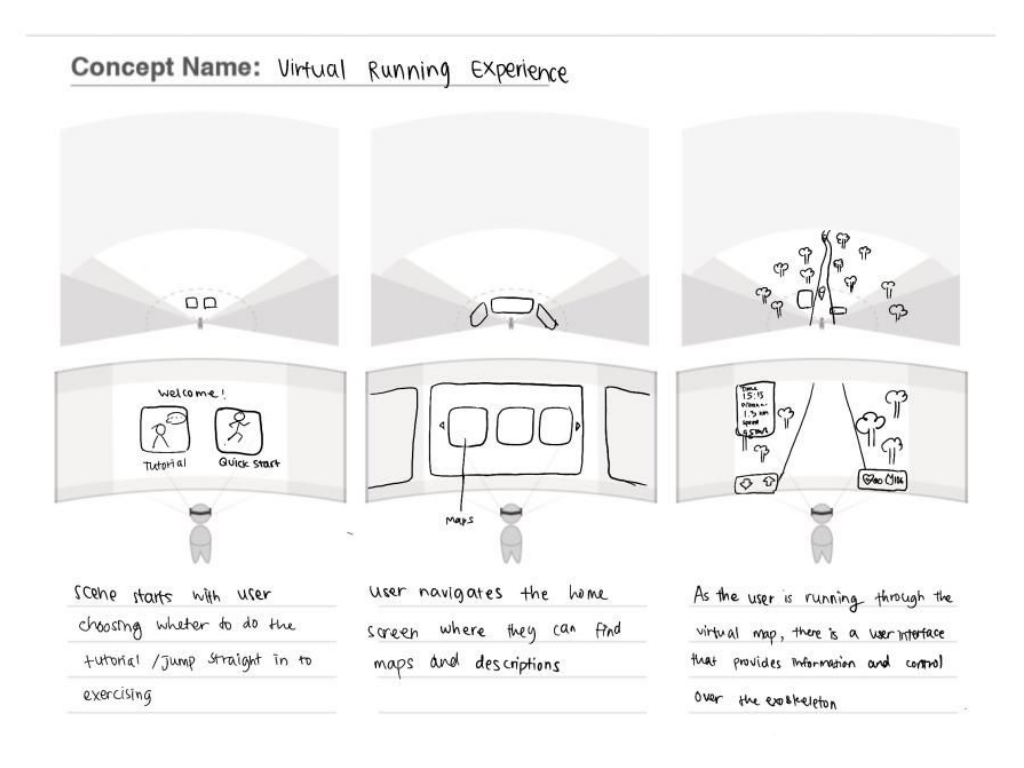
PROBLEM #3

Distracting interface on the sides during workout

SOLUTION #3

- Adding a small button to hide the interface
- The end button is not apparent until the user presses the small button

WIREFRAMING VIRTUAL REALITY

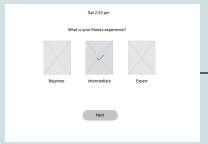


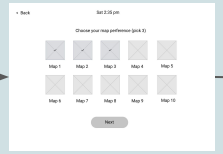
Some of the things we need to specify are:

1. **Scene**- Once the user puts on the headset, what do they see?
2. **Spatial** - What is the space like? How does it mimic the real world?
3. **Affordances** - What can the user do? Can they navigate? If yes, where? What items are clickable?

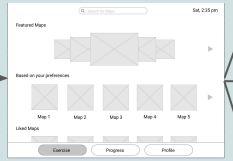
WIREFLOW

LANDING PAGE

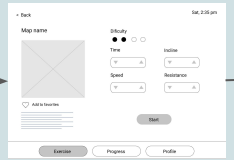




EXERCISE TAB

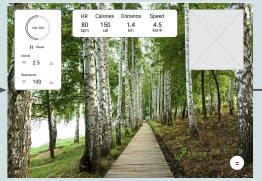


PROFILE TAB



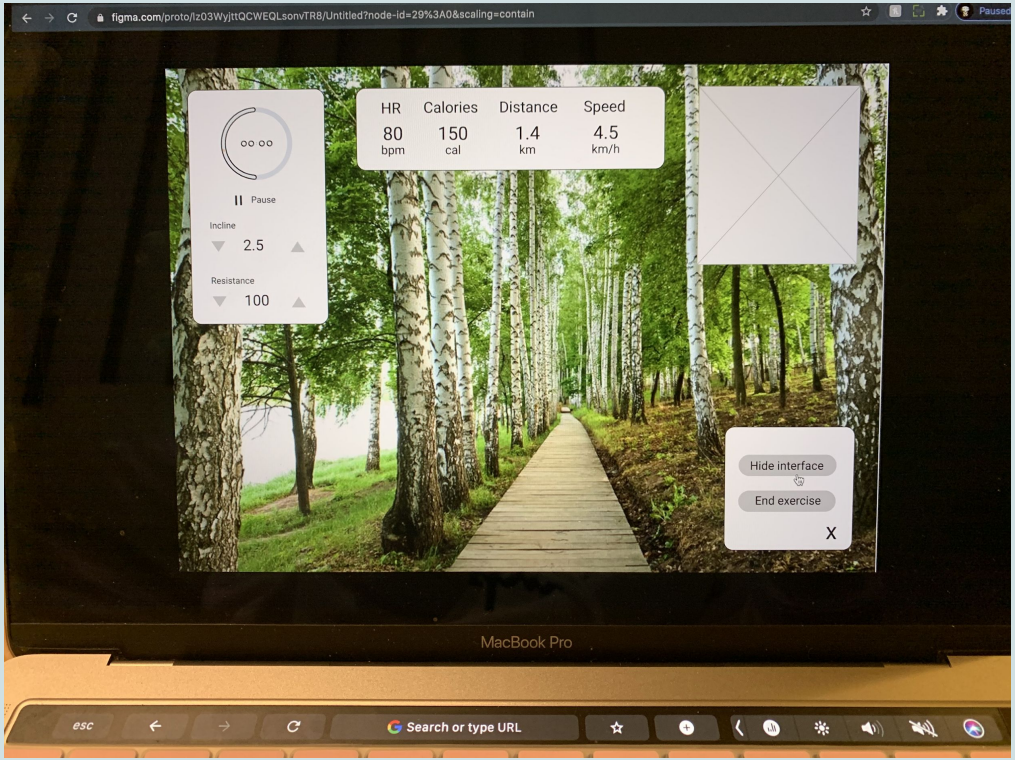
PROGRESS TAB

EXERCISE



WORKOUT SUMMARY

LOW FIDELITY INTERACTIVE PROTOTYPE



USER JOURNEY MAPPING

LISA JONES

USER

Lisa Jones is a software engineer and a 37-year-old mother. She likes to go on marathon competitions and keep herself healthy. She uses a Fitbit to keep track of her body and find balance in her life.

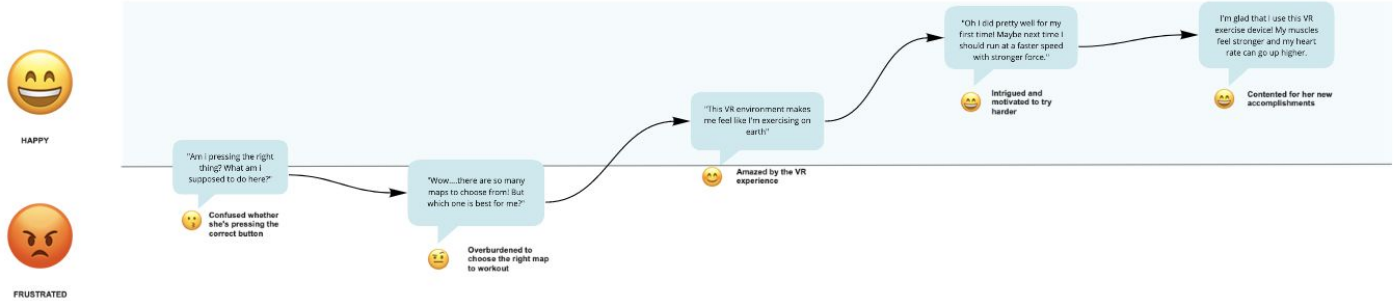
SCENARIO

Lisa plans to go on space travel as part of her work, so she is worried about damaging her health while she is in space. She wants to make sure that she is as fit as she is now. She's also worried that she won't be able to enjoy exercising in space as much as she does on earth because the environment is different.

GOALS & EXPECTATIONS

- Having a satisfying experience of working out in space
- Being able to adapt to exercising in space quickly
- Seeing improvements in her fitness journey
- Staying fit in space

PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5
Exploration	Choosing a map	Workout	Reviews Performance	Witnesses improvement
• Getting to know the VR interface and exoskeleton machine • Choosing map preference • Exploring what happens to the VR environment if she clicks a button	• Look at the directory of workouts • Read map description, level of difficulty	• Press start button • Changing workout settings during the exercise (like speed, resistance, hiding interface etc)	• Check on the summary of her performance after the workout	• Go to progress tab and check and compare her performance to previous weeks

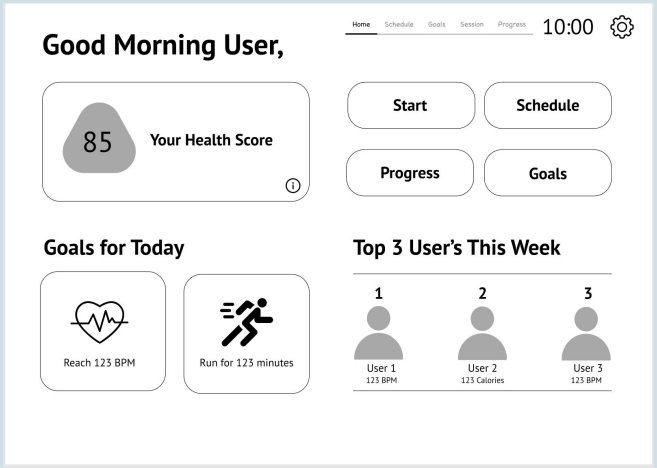


TOUCHPOINTS

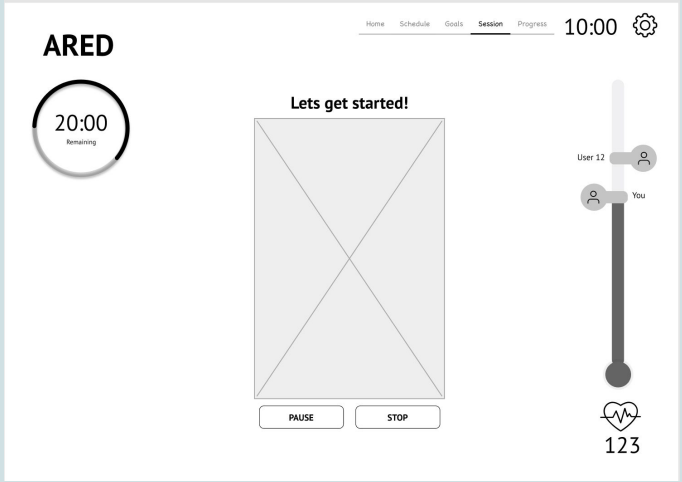
System ask user's pre fitness experience and map preference then gives a preview through the VR environment	Filtered results on map recommendation section and like (heart button) function for the map	Response to the user's input on exercise settings during the workout	Shows the summary of the user's workout (calories burned, distance, etc)	Visualisation of the user's achievement and improving results

Concept 2

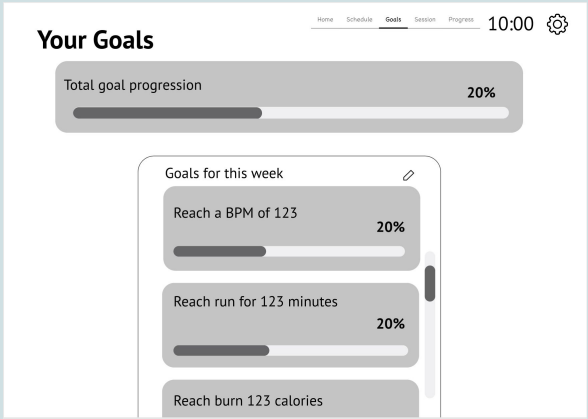
SMART Goal Holographic Screen



GIVES YOU ATTAINABLE GOALS



TIME EFFICIENT DEVICE

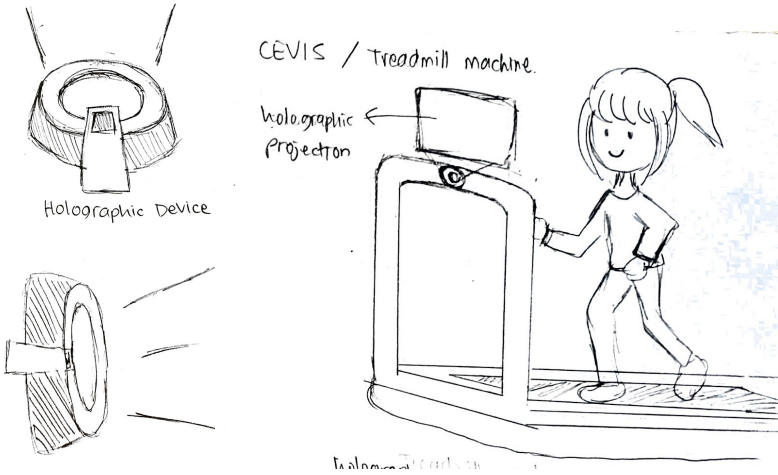


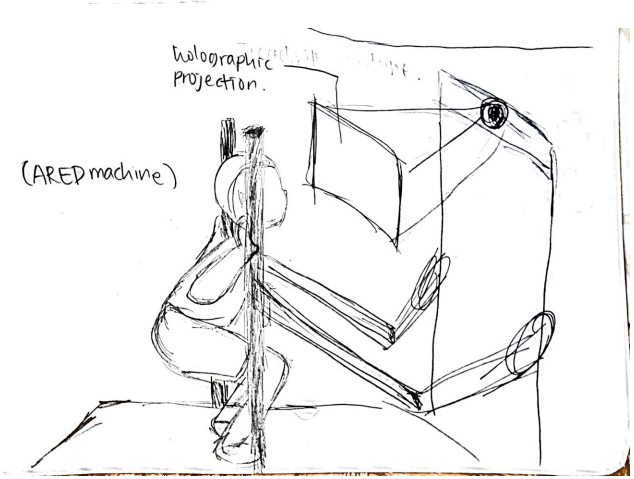
WORK OUT WITH YOUR PERSONAL COACH

Concept 2

Smart GOAL Holographic Screen

- Find a workout that is effective in an unfamiliar microgravity environment
- Providing users with the right level of challenge relative to their current strength capability
- Every user has their reserved work out session. The machine will be ready for their use— no log in or setting up required
- Ranked system to motivate users to push their limits
- Voice user interface to easily navigate through the screen





Concept 2

Why on Hologram?

- Doesn't take up much space, considering that space in a spacecraft can be quite limited
- Display is flexible to the user's preferences (position of the screen)
- Can adapt to where the user is facing since there is no risk of compromising space. Additionally, users don't have to reach out all the time for adjustments.

How the users would interact

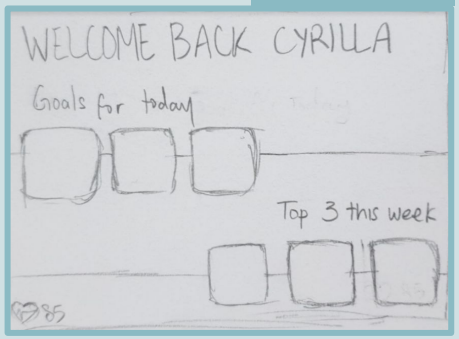
- Voice recognition
- A sensor on the device that detects your hand movement and gestures.
- Adapts to users orientation, screen shows up in the area in which user is facing

(Businessman Using Hologram Screen With Digital Data Wall Mural | Wallpaper Murals-sdecoret, 2020)

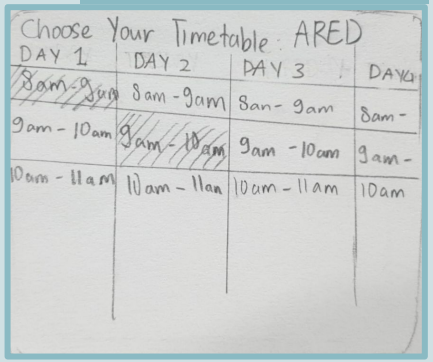
(Wu, 2011)

Concept Sketches

HOME SCREEN



USER PERSONALIZATION



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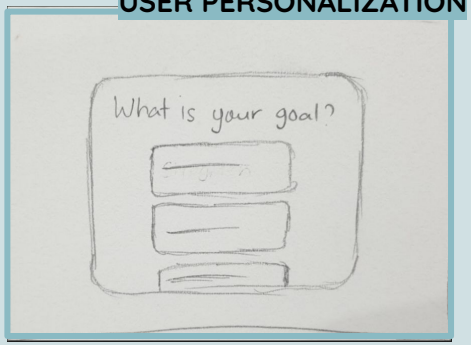
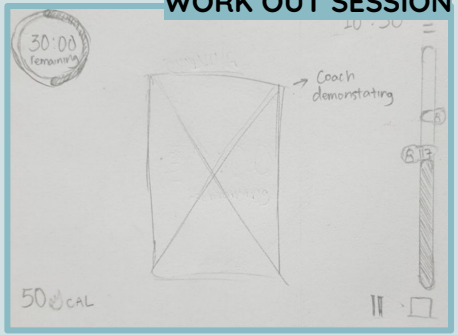
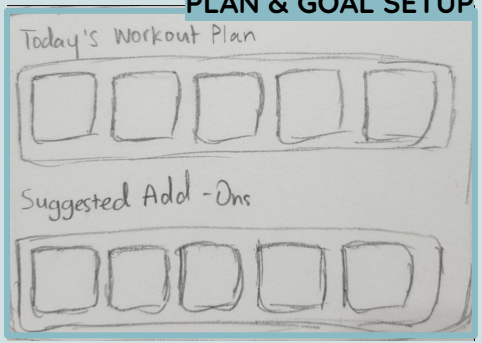


WORK OUT SESSION



PLAN & GOAL SETUP



Features

The features of this device would include :

- User personalisation
- Customisation of user goals according to their personal wants and needs
- Include voice user interface and touch user interface
- A coach on the holographic screen during workout session

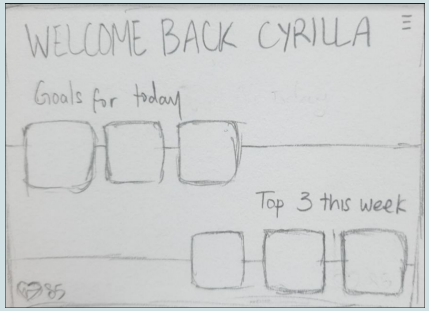
This device is aimed towards:

- Adapting new travellers to stay fit in space
- Reduce the time it takes for users to set up their workout environment and start exercising
- Emphasising the importance of achieving user's fitness goal during their space journey

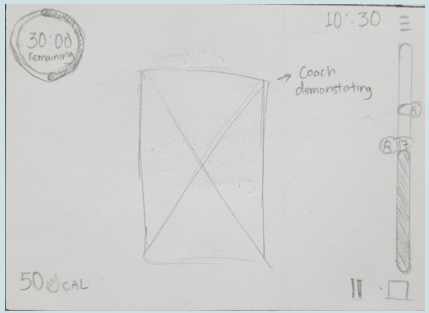
Figure : Concept 2 Ideation Sketch

User Testing

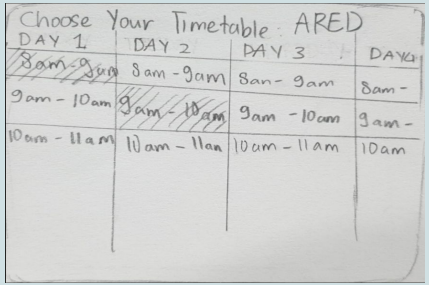
Home page



Session page



Scheduling page



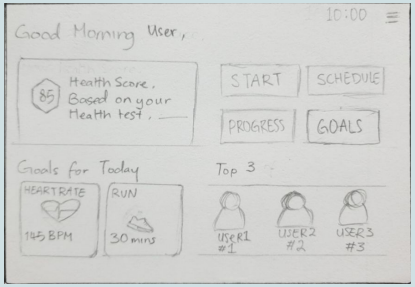
Main insights :

- Home page needs to be simpler so that users can **easily navigate**.
- Stop and pause symbols on the sessions page need to be **clearer.**
- Scheduling process need to show dates and whether it has been reserved or not.
- Users want to be able to add their **personal goals.**
- Progress page needs to be **simplified**.

REDESIGN

PROBLEM #1

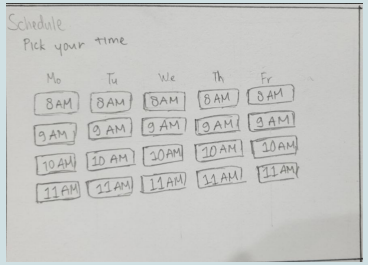
SOLUTION



- Added buttons to the right hand side

PROBLEM #2

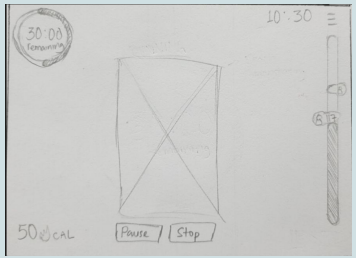
SOLUTION



- Dates are added on top of each time.

PROBLEM #3

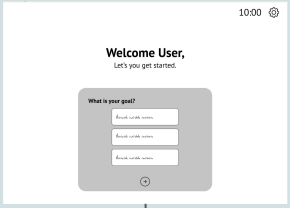
SOLUTION



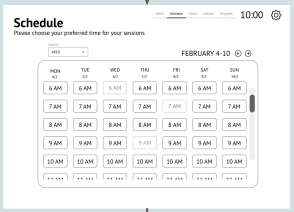
- Symbols changed to button with words.

WIREFLOW

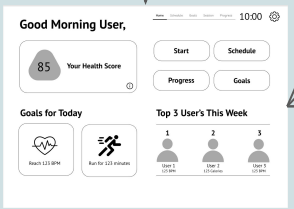
ONBOARDING



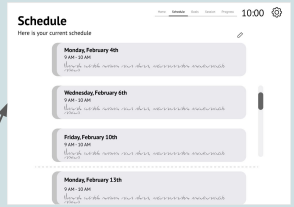
RESERVATION



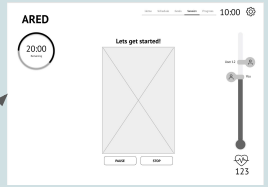
HOME



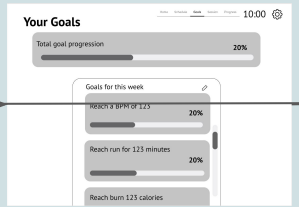
SCHEDULE



WORKOUT

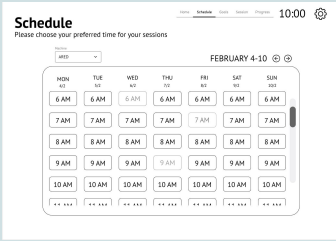


GOAL

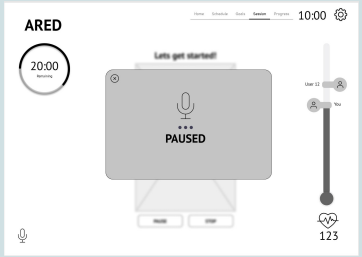


PROGRESS

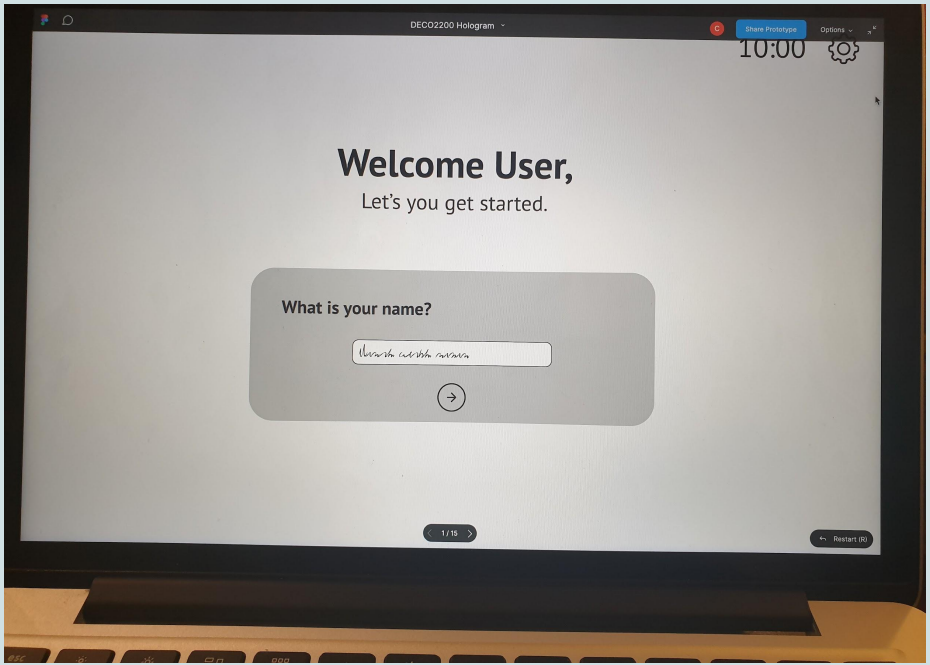
RESERVATION



VOICE USER INTERFACE



LOW FIDELITY INTERACTIVE PROTOTYPE



USER JOURNEY MAPPING

JAMES JAMINSON

USER

James Jaminson is a 32-year-old male working in a tech company. He enjoys having a consistent workout schedule but tends to fall out of it from time to time. He strives to find some sort of leverage to keep him motivated to work out.

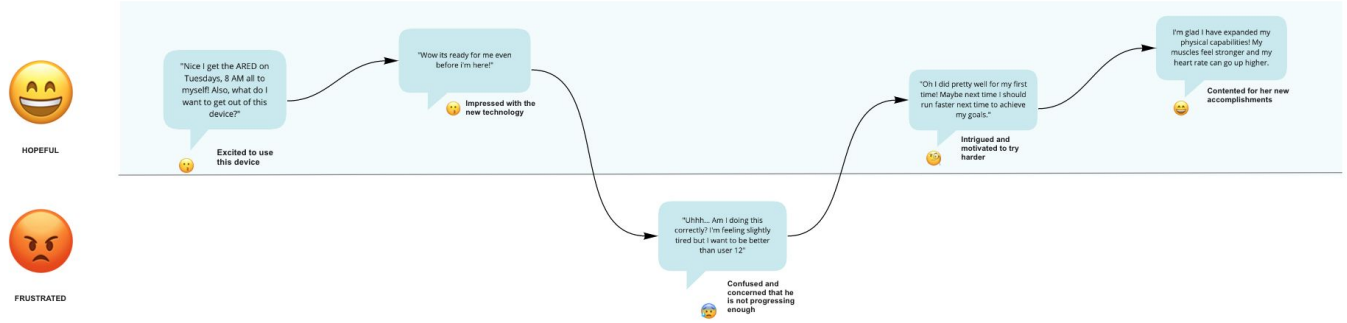
SCENARIO

James is recruited for work in Mars as a part of the company's expansion into space. He understands the importance of keeping himself and top shape during his journey, however, is worried that he might become unmotivated and unable to stick to his fitness goals. James is also worried about not having space for him to workout as the machines are very limited in numbers.

GOALS & EXPECTATIONS

- Find the right workout routine and intensity for staying healthy in space
- Check up on his health to see if he is pushing himself to the right amount of exercise
- Needs to have goals that are attainable and realistic

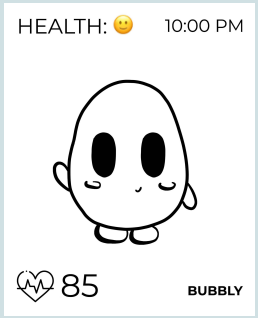
PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5
Inputs his details	Starts session	Works out	Reviews Performance	Achieves goal and witnesses improvement
• Review current goals of his workout plans • Define new health goals • Inputs information into the system • Reserves a schedule for his workout sessions	• User enters workout area, machine is ready for user. • User sees the top 3 users of the week.	• Check out the workouts in the program • Unsure if he is doing the workout right • Times his workout • Tries to accomplish his goals for that session	• Check on the summary of his performance after the workout • Analyse what he needs to in his next session to achieve his goals.	• Check on the summary of his performance after the workout • Analyse what he needs to do to challenge himself and reach a higher goal

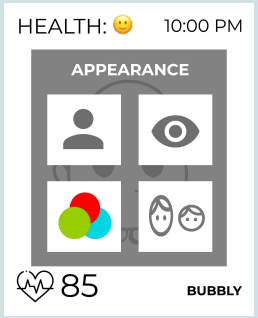


TOUCHPOINTS				
Welcoming message and a short onboarding session	Home page displays and user can check on his goals for that session and start session	Device shows the at what point he has progressed to and a virtual coach in the middle to instruct him what to do.	A graph showing the summary of the user's workout	Visualisation of the user's achievement and improving results using graphs and indications to show that user has achieved his goals.

Concept 3

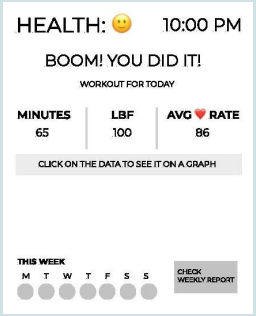
Virtual Pet Raising Game

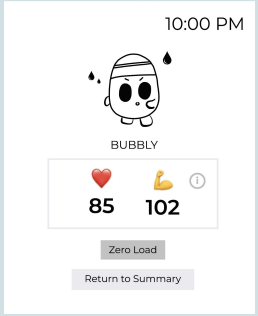




REAL-TIME WORKOUT DATA

CUSTOMISABLE CHARACTERS





RESPONSIVE DESIGN

Concept 3

Virtual Pet Game on an Apple Watch

- User's muscle and bone health = pet's health
- Lock screen for easy access
- A remote control for the workout devices (i.e. CEVIS, ARED, and COLBERT)

Why an Apple Watch?

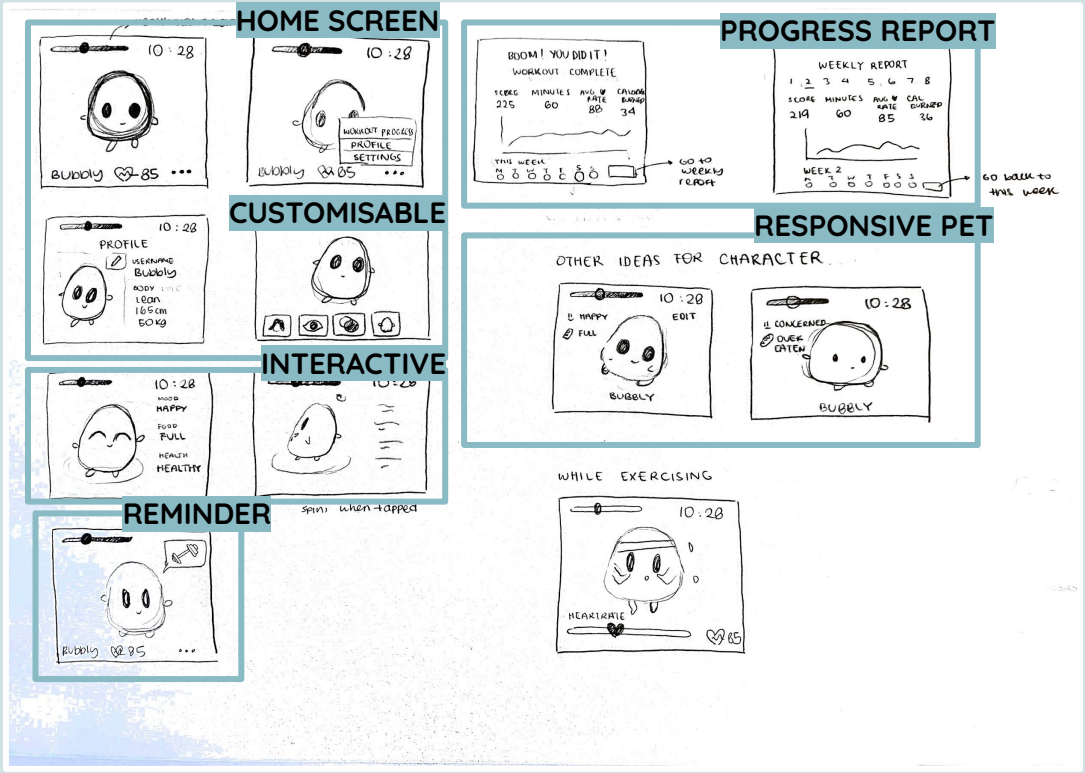
- Real-time growth (monitor 24/7)
- Avoid struggling to grab or walk to a device in a microgravity environment
- Allows connection to existing fitness apps
- Workout screen can be navigated easily during workouts

(*Apple watch series 6*, 2020)

(*Apple Watch Series SE*, 2020)

(*Tamagotchi*, 2020)

Concept Sketches



Features

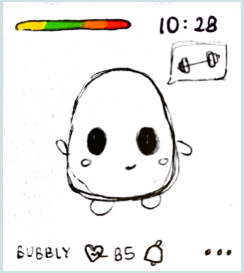
The features of the app would include :

- Customisable character design
- Progress report of the user's workout performance
- Responsiveness to the pet's health status (i.e. reminders, change in pet's body shape)

Health Status

- Muscle and bone health
  - Atrophy
  - Osteoporosis
- Food intake and exercise

User Testing



Home page

Progress report

Pet

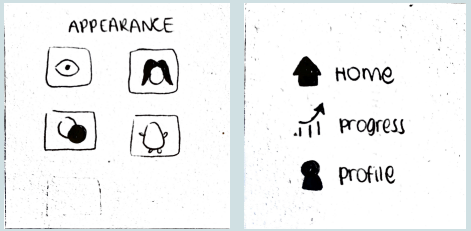
Main insights :

- Enable appearance change directly on the character. There are **too many steps** to get to the Appearance page.
- To provide valuable information, the data on the graph should be based on **what the user wants to see** instead of showing just the heart rate.
- Make the **pet more expressive** and allow the user to interact with it. It should express a feeling of sadness when it's not healthy.

REDESIGN

PROBLEM #1

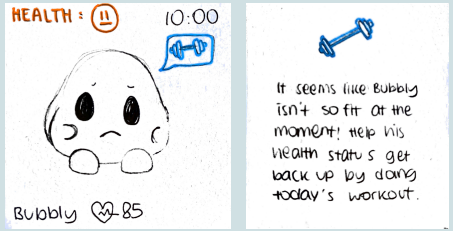
SOLUTION



- Hold tap on pet for Appearance
- Hold tap on any empty space for Menu

PROBLEM #2

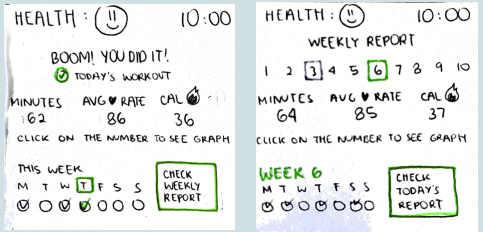
SOLUTION



- Pet becomes sad when it's not healthy
- Speech bubble is a button that leads to Help and Documentation

PROBLEM #3

SOLUTION



- Graph can be expanded and collapsed when the user taps on the data

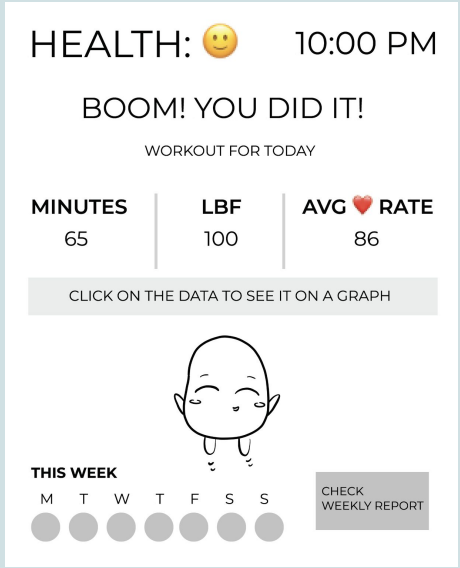
REFRAMING: RE-EMPHASISING MUSCLES AND BONES

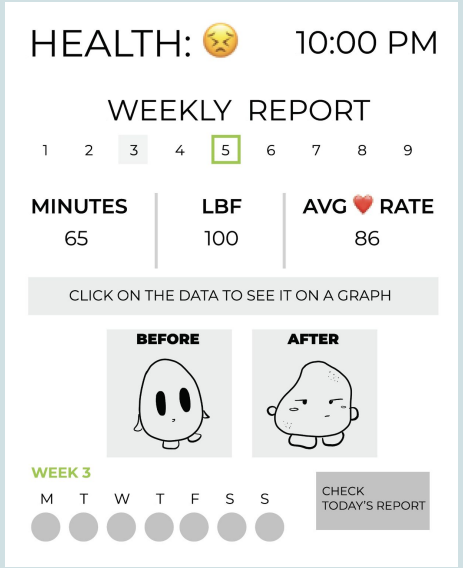
Calories Burned to LBF (Pound-mass)

- LBF is pound-force, a measurement used for force
- Goal is to gain muscle mass, not burn calories

Visualisation of Muscle and Bone Condition

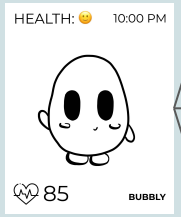
- Emphasise the changes of the muscle and bone condition of the user



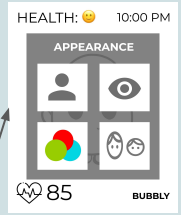


WIREFLOW

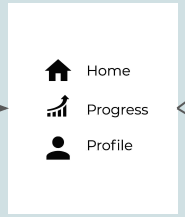
HOME



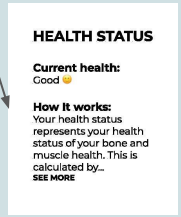
APPEARANCE



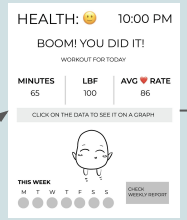
MENU

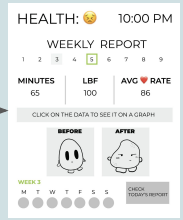


HELP & DOCUMENTATION

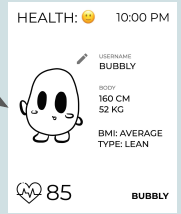


PROGRESS

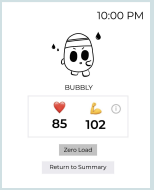




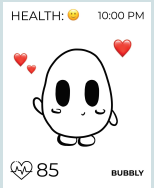
PROFILE



WORK OUT



INTERACTIVITY



USER JOURNEY MAPPING

AMELIA HEALEY

USER

Amelia Healey is a 28-year-old digital marketing manager. She has never had a workout routine, and she does not enjoy any sports in particular. She uses an Apple Watch because of her busy schedule.

SCENARIO

Amelia will be going on a business trip to Mars in the coming week, and she is extremely concerned about the intense exercise she will have to do every day. She doubts that she will be able to keep up her strenuous workout routine when her body is not used to working out every day.

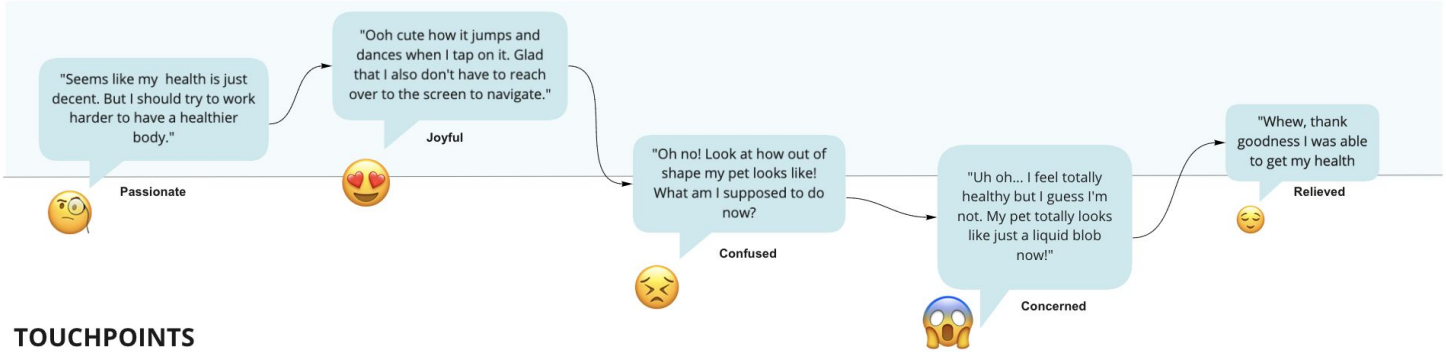
GOALS & EXPECTATIONS

- Stick to a workout routine
- Find an effective way to remind herself to exercise for her own good
- Be able to know when her health is in danger

PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5
CONSCIOUS	INTERACT	VISUALISE	MINDFUL	RECOVER
• Be aware of the current bone and muscle health • Informed of the latest health status 24/7	• Spend more time with the pet as it interacts with the user when they tap on the pet or eat healthy • Use the watch as a remote control while working out in order to navigate through the screen	• See a visual change in their health through the character's appearance • Easily comprehend the workout progress through a visual summary	• Be alerted when bone and muscle health is in danger • Maintain healthy bones and muscles through its health indicator	• Recover from an unhealthy condition of bones and muscles • The pets start losing its form and distinctive shape to represent the deteriorating bones and muscles

HOPEFUL

FRUSTRATED



TOUCHPOINTS

User sees the featured body shape of the pet that is relative to the user's body data input and understands their bone and muscle health.	User taps the pet to see its response. User uses the buttons on the Apple Watch to navigate through the workout screen.	User is aware of how the character's health is changing through the pet's body shape and form.	User is alerted when the pet's health is in serious danger. The health status flashes, and the pet keeps sending notifications on what the user should do.	User is updated of their latest status through responsive design.


HEALTH:
10:00 PM
85
BUBBLY

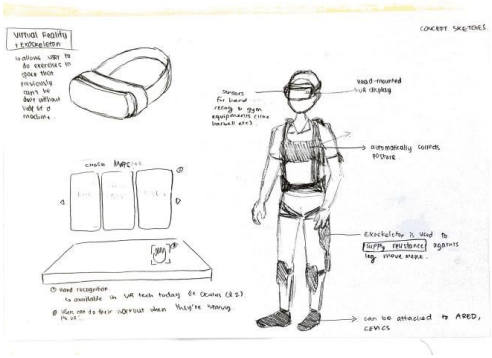
Narrowing Solutions

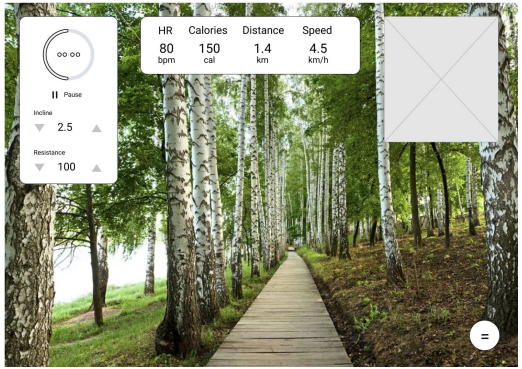
Narrowing Solution

For our next design process, we have decided to further develop our ideas on concept 1 - **Virtual Reality Exercise Device**

Why?

- **More versatile**
  - Integrated into daily activities of users
  - Join workout sessions with people not on spacecraft
  - A fun and interactive virtual reality experience is a better incentive for users rather than a rational workout plan. A virtual pet raising game can be easily disregarded since it's a separate device from the workout devices.
  - The VR is directly implemented into the workout sessions, reducing the additional step for users to use another system (SMART Goal Holographic Screen) or an app (Virtual Pet Raising Game).





References

Apple watch series 6. (2020). [Image]. Retrieved from https://www.cnbc.com/2020/09/25/apple-watch-series-6-review-the-best-smartwatch-minor-update.html

Apple Watch Series SE. (2020). [Image]. Retrieved from https://www.engadget.com/apple-watch-se-review-watchos-7-price-specs-comparison-172542713.html

Blain, L. (2020). Oculus Quest can now give you beautifully tracked virtual hands in VR. Retrieved 2 October 2020, from https://newatlas.com/vr/oculus-quest-hand-tracking-vr/

Cycling on the International Space Station With Astronaut Doug Wheelock. (2020). [Video]. Retrieved from https://www.youtube.com/watch?v=bG3hG3iB5S4

Fitness Mirror. (2020). [Image]. Retrieved from https://throomers.com/mirror-the-nearly-invisible-interactive-home-gym/

Garmin Game App. (2020). [Image]. Retrieved from https://buy.garmin.com/en-AU/AU/p/607993

Hall, L. (2013). Exoskeleton Could Give Improved Mobility and Strength. Retrieved 2 October 2020, from https://www.nasa.gov/offices/oct/home/feature_exoskeleton.html

How astronauts exercise in microgravity. (2020). [Video]. Retrieved from https://www.youtube.com/watch?v=qd4_BqG9aYI

How do Astronauts Exercise in Zero Gravity?. (2020). [Video]. Retrieved from https://www.youtube.com/watch?v=ZoZkvUHBI-w

References

Jang, E. (2019). Hand gesture recognition technology brings real hand into virtual reality. Retrieved 1 October 2020, from https://medium.com/@Chengccc/hand-gesture-recognition-technology-brings-real-hand-into-virtual-reality-7b193d3a7173

NASA's Ironman-Like Exoskeleton Could Give Astronauts, Paraplegics Improved Mobility and Strength. (2013). [Image]. Retrieved from https://www.nasa.gov/offices/oct/home/feature_exoskeleton.html

Netflix Show Black Mirror Pushes Boundaries Of Virtual Reality. (2019). [Image]. Retrieved from https://www.forbes.com/sites/sap/2019/09/17/netflix-show-black-mirror-pushes-boundaries-of-virtual-reality/#60dd6a5a459c

Nike Training Club App. (2020). [Image]. Retrieved from https://blog.subduethesloth.com/2018/11/30/nike-run-club-lost-my-data/

Oculus Quest Hand Tracking Is HERE. (2020). [Image]. Retrieved from https://www.youtube.com/watch?v=mNZSv-9GgVY

Oculus Quest Hand Tracking VR. (2020). [Image]. Retrieved from https://newatlas.com/vr/oculus-quest-hand-tracking-vr/

Tamagotchi. (2020). [Image]. Retrieved from https://www.amazon.com/Tamagotchi-42867-Original-Sahara/dp/B0829QZWXH

Train Like an Astronaut -- ARED. (2020). [Video]. Retrieved from https://www.youtube.com/watch?v=7oBvNxbTF28

Week 4 - Ideation – Exploring Opportunities. (2020). Lecture, Week 4 Modules.

Wallsheaven.com. 2020. Businessman Using Hologram Screen With Digital Data Wall Mural | Wallpaper Murals-Sdecoret. [online] Available at: <https://wallsheaven.com/wall-murals/businessman-using-hologram-screen-with-digital-data-A168963321> [Accessed 1 October 2020].

Wu, J., 2011. *Holographic Computer Touch Screen*. [online] Available at: <https://www.youtube.com/watch?v=YZCIsgOaUaA> [Accessed 3 October 2020].