TOMIWA AINA

Multimedia + UX Designer

I believe that by understanding a user's story we can solve any design problem. My design process encompasses the full story: from clients' needs to user's problems, and creating and implementing design solutions. This is why, unlike most designers, I don't just have skills in visual design but also user research, innovation, and business management.

MY UX PROCESS

Discover

Understand the client's tasks and problem. Perform exploratory research into the needs of the intended users and other stakeholders.

Define

Synthesize research, find themes and interpret findings. Define the target user, the use case and the problem statement.

Design

Generate concepts through brainstorming techniques. Test ideas with low fidelity prototypes. Select the most valid concept.

Develop

Review, refine, test and reiterate the chosen concept. Analyze the business case. Return to the design stage if necessary.

Deliver

Fine-tune the product for final testing and implementation. Provide a business plan and timeline for production.

PROJECTS

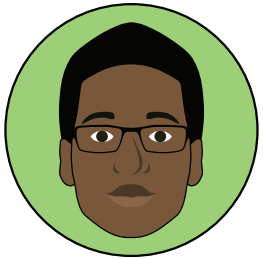
This portfolio will outline 2 of my projects that demonstrate this process in action. For more of my projects I have a 2nd portfolio showing my works in motion graphics, graphics design, branding, 3D modeling animation and other forms of visual design.

travel with
VERSUS ARTHRITIS

An app concept for Versus Arthritis that enables Arthritis sufferers to travel through public transit pain-free. I acted as a user researcher and interviewer.

ODYSSEY
A VR EXPERIENCE

A virtual reality video game focused on maximizing the users' usable space. I acted as lead modeler, animator and UX researcher.



My visual design portfolio can be accessed at tomiwa.aina.carbonmade.com

PROJECT 1

Project Task:
Propose innovations that can make the public transport network in London more inclusive and 'pain friendly' for people with chronic pain and arthritis.

This was done as a collaborative project in Loughborough University London by students for the charity Versus Arthritis.

Span: Oct. 2018 - Dec. 2018

PROJECT 1: TEAM MEMBERS & ROLES

Tomiwa

Primary Research
Secondary Research
User Interviews
User testing
App Design

Don

Secondary Research
Development
Prototyping
App Design

Farida

Secondary Research
Business Plan
Implementation
Roadmap
Costs Examination

Arin

Secondary Research
Prototyping
App Design

Nabeel

Primary Research
Secondary Research
Surveys
App Design

PROJECT 1: DISCOVER

Secondary Research

To begin research, the whole team performed exploratory desk research allowed them to gain background information on arthritis, chronic pain, and its sufferers. Two online sources for exploratory research; **available medical data** and **first-hand qualitative experience**. This way, factual and empathic perspectives on the key user group were reflected in the research.

Findings

Target User research (Tomiwa, Nabeel)

- Most common pain triggers exercise and increased movement
- Being such a busy city, public transport in London tends to be very crowded, and trains very turbulent. This makes the most common forms of transportation uncomfortable for most arthritis sufferers.
- Pain causes immobility for many sufferers so they depend on public transport.
- Most sufferers are in the working class and the condition affects their income

Market research (Dom, Farida)

- Most common products sufferers use to manage pain are physical products and mobility schemes that make it easier for them to move
- Doctors recommend physical programs and exercises as the best form of pain management
- There were no transportation-based applications targetted at sufferers
- Most pain management applications were poorly reviewed

Key Findings

PROJECT 1: DISCOVER

Primary Research

Primary research was then performed to gain more specific data on pain management and travel patterns from actual chronic pain sufferers. An online survey was produced (by Nabeel) and circulated on forums and social media groups for Arthritis sufferers (by Tomiwa & Nabeel). The survey was filled out by 27 people.

Findings

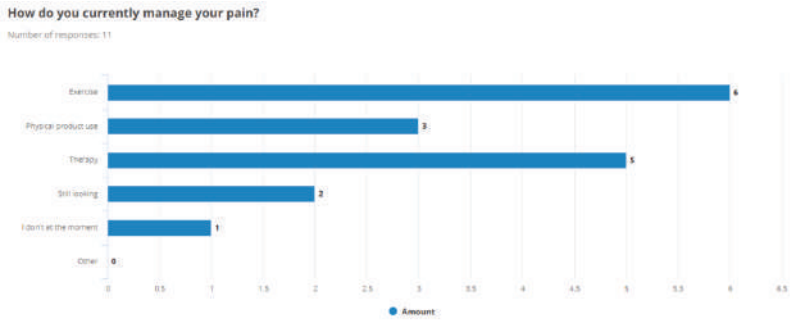
(Tomiwa, Nabeel)

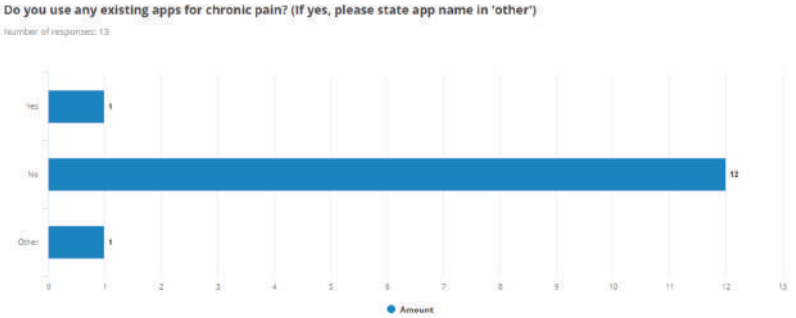
- Most sufferers do not use physical products and mobile applications to ease pain but just use exercise
- They all used mobile travel apps for commuting (like google maps and Citymapper)
- Most surveyed users used trains or buses every day
- Users appreciated having multiple routes or forms of transport allowing them to choose the most pain-free routes
- Most pain during travel was caused by having to stand during travel and long waits for transit without seating.

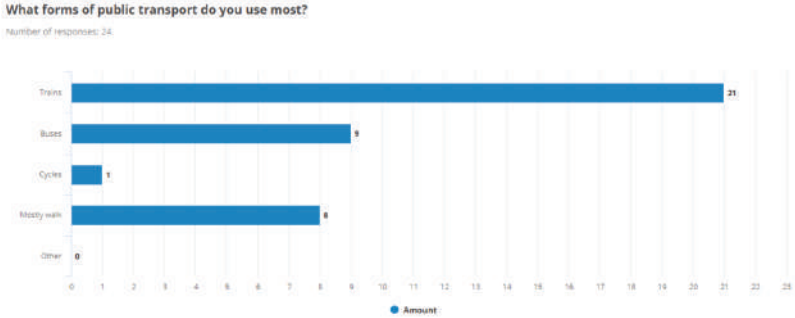
Key Findings

PROJECT 1: DISCOVER

Findings (Data Overview)







PROJECT 1: DISCOVER

Client Needs

With an understanding of the Users' problems and needs, the team also spoke with Versus Arithtis (VA) reps over skype to understand their needs as Stakeholders.

Insights

(Dom)

- VA aims to spread awareness of chronic pain because non-sufferers often can not empathize with the condition and some sufferers are not knowledgable of their conditions and suffer in silence

- VA gathers information on sufferers to help their conditions. They currently have no key source for transit data

VERSUS ARTHRITIS

PROJECT 1: DEFINE

With insights from our research, we all came together and defined our target user and problem statement.

Problem Statement

The group generated a problem statement to get a concise description of the issue. We initially all wrote own problem statements individually from our research before bringing them together. Each one was addressed and used to formulate the final problem statement:

'Sufferers of arthritis tend to use public transport less due to the lack of products, services, and facilities. How can we make it easier for people with arthritis to travel more comfortably while keeping costs low and generating sufficient data for Versus Arthritis?'

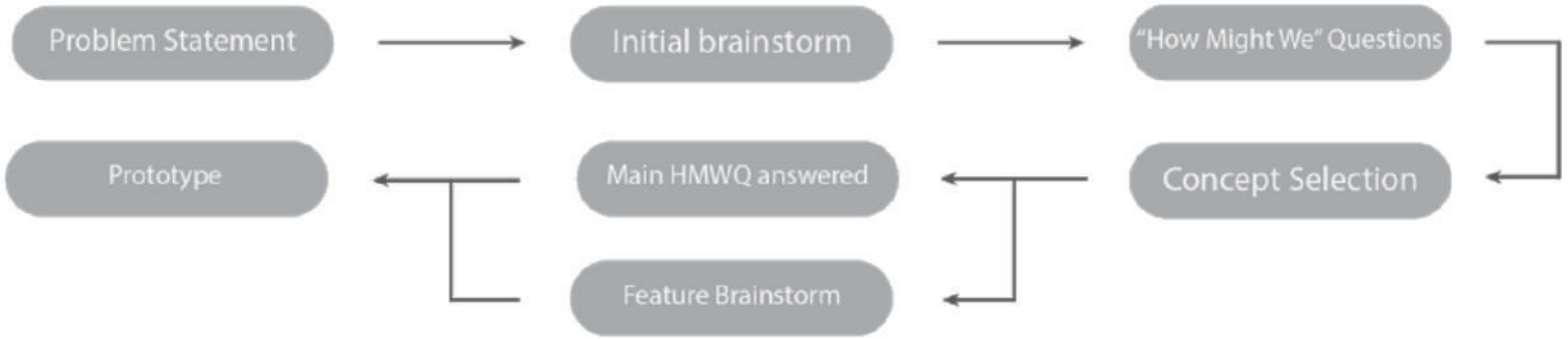
Target User

- In terms of demographics, the team aimed to attract users from around the ages of 18-60 who are of working-class, or students commuting through London daily.
- Low-income earners (because of constant medical costs and immobility)
- suffering from osteoarthritis or rheumatoid arthritis (most common types)

PROJECT 1: DESIGN

Following the problem statement Don made an ideation plan that draws heavily on Design Thinking methods and activities of concept generation.

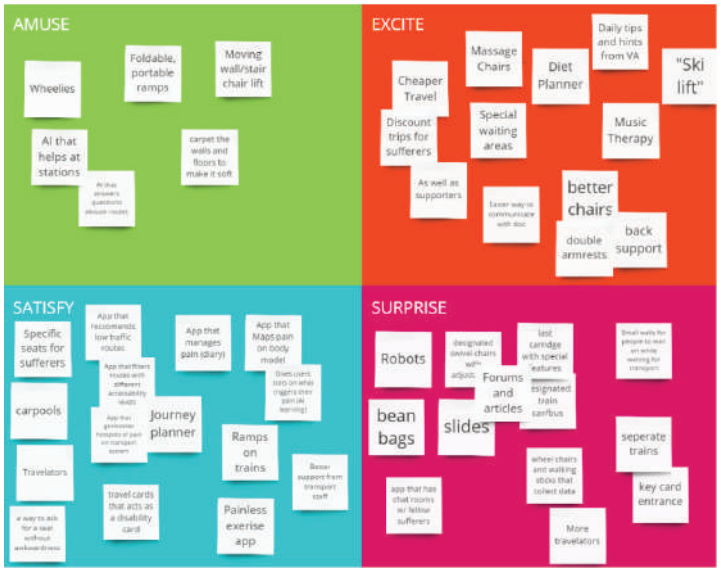
Concept Generation Plan



PROJECT 1: DESIGN

Initial Brainstorming (Amuse, Excite, Satisfy, Surprise)

The aim of this brainstorm was to get as many ideas down as possible with no limitations. The board was divided into four main areas: ideas that would **EXCITE** the user, **SURPRISE** the user, **SATISFY** the user, and **AMUSE** the user.



PROJECT 1: DESIGN

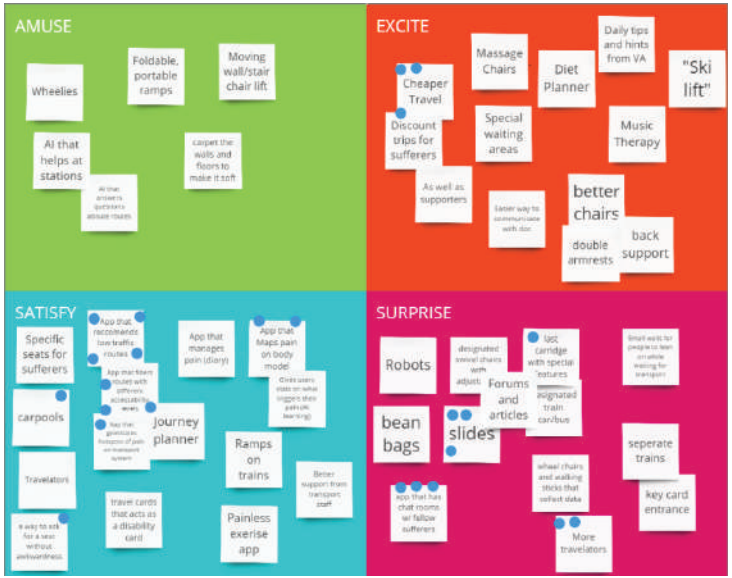
How Might We (HMW) Questions

The next stage of brainstorming involved establishing "How Might We Questions". HMWQ's got us thinking about how our potential solutions addressed the most pertinent problems found during research.

PROJECT 1: DESIGN

Concept Selection and Voting

Once the team had decided on the most important issues to be addressed the team voted on the concepts. Each team member was given 5 votes allowing us to prioritize the selected concepts.



Top Concepts

Satisfy
- App that recommends low-traffic and pain free routes - 8
- AI that gives users stats on what triggers their pain - 2
- Carpools for sufferers - 1
- button to show you need a seat - 1

Excite
- Discount trips for sufferers - 3

Surprise
- app with chat rooms for sufferers - 3
- slides for pain free travel at stations - 3
- More travelators (moving walkways) - 2
- train carriage with special features to reduce pain - 1

PROJECT 1: DESIGN

Concept Selection and Voting

Once these concepts were ranked, the related "How might we" questions were grouped beside the concepts so we could see how well the solutions addressed the problems.

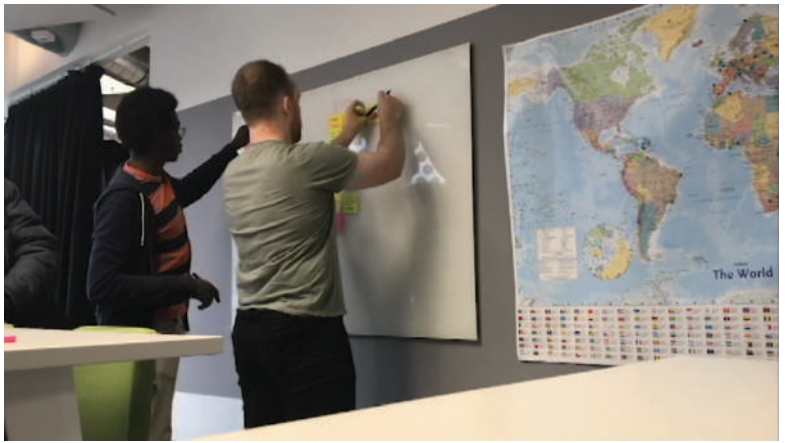
The final chosen concept was the app that recommends pain-free travel routes because it had the most votes and answered the most HMWQ's meaning it would address many of the users' problems.

PROJECT 1: DEVELOP

Feature Brainstorm

We then generated all the possible features that could be implemented within the app. These features were adopted for other ideas conceptualized earlier in brainstorming. The potential features discussed are listed below. All chosen features were implemented within the app prototype, as they were the highest priority from the HMWQ's and could quickly be prototyped for testing.

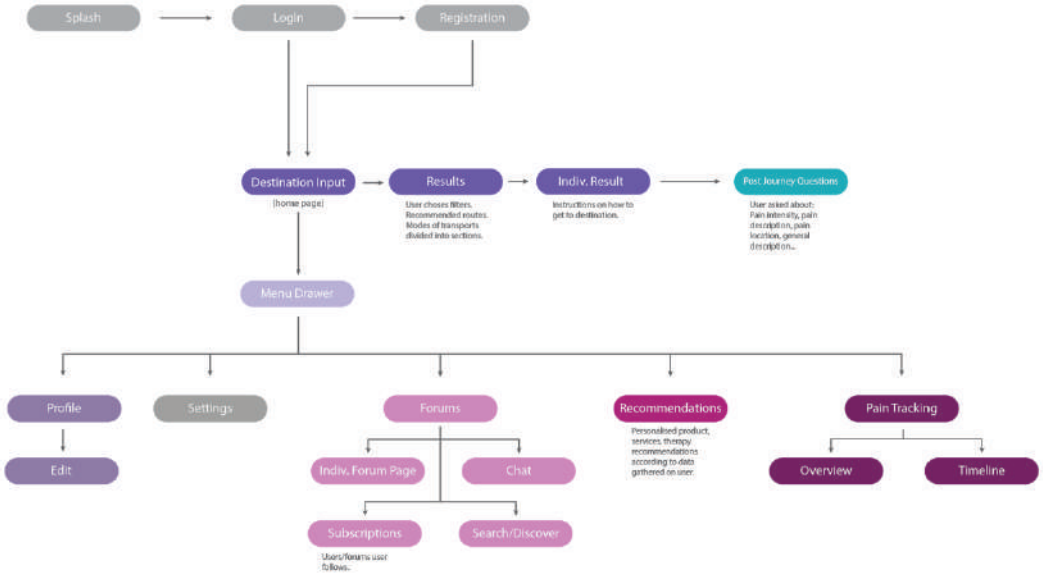
- Navigation (Main Feature)
- Accommodation and accessibility filters (Main Feature)
Offline Mode
- User feedback on routes
- Search feature.
- Social network forums (Main Feature)
- Chatbot for medical advice (based off VA website).
- User Customisation.
- Collection of Data (travel patterns)
- Recommendations based on personal data (Main Feature)
- Pain trigger tracking
- Notifications (traffic, alternative routes, etc.)
- Separate Logins (users/VA admins).
- Products, programmes, and services search integration
- Contact us section.
- Entertainment section to distract from the pain
- Booking section (doctor appointments).
- Ordering prescribed medicine
- Tutorial (to introduce the user to the apps features)
- Ridesharing.

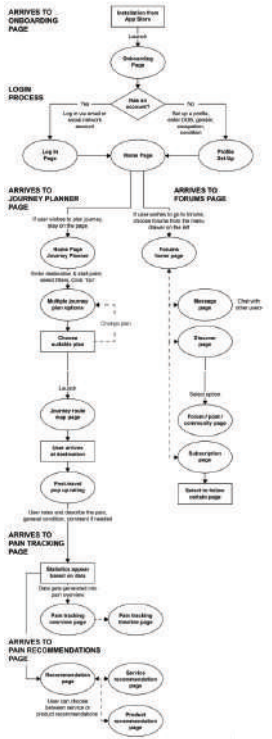


PROJECT 1: DEVELOP

Sitemap & User flow

The next step was to plan out the app. The site map on the left was made to understand the general form and screen progression. The User Flowchart on the right demonstrates how the app would work from the beginning when the user downloads it and how the various features connect with each other on the app.

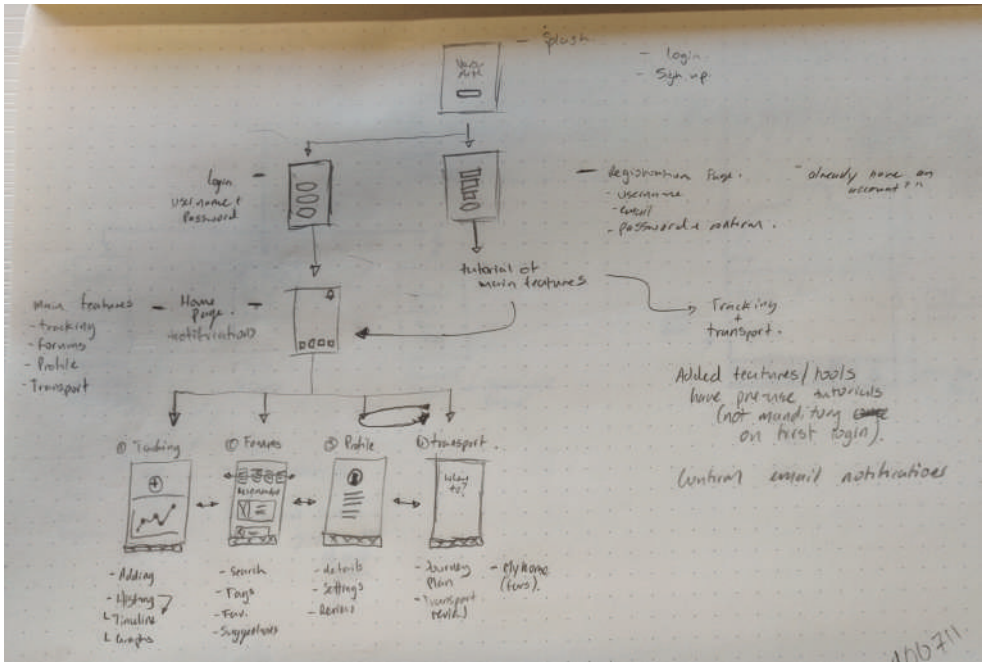


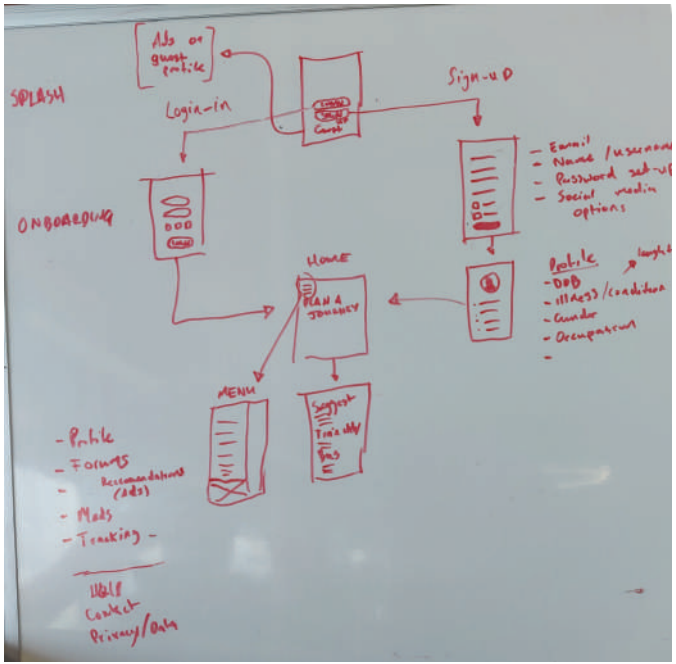


PROJECT 1: DEVELOP

Sitemap & User flow (Sketches)

Original sketches used to develop the sitemap and user flow.



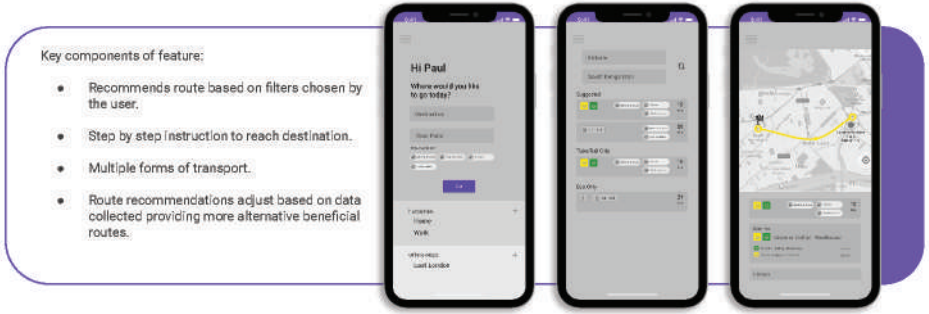


PROJECT 1: DEVELOP

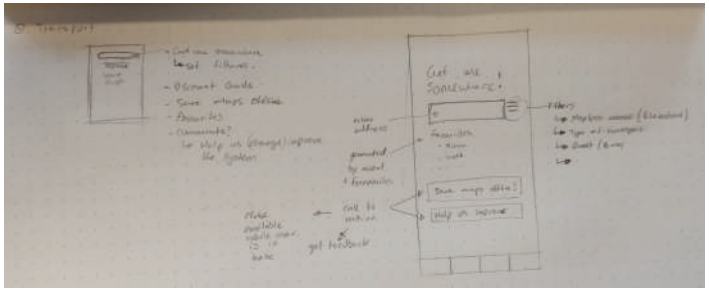
Prototype

(Dom & Arin)
A prototype was made of the 4 major features of the app: **Travel route recommendation**, **Pain tracking**, **Online Forum**, and **Product/Service Recommendation**. The prototype was made on Adobe XD.

Prototype Feature 1: Travel



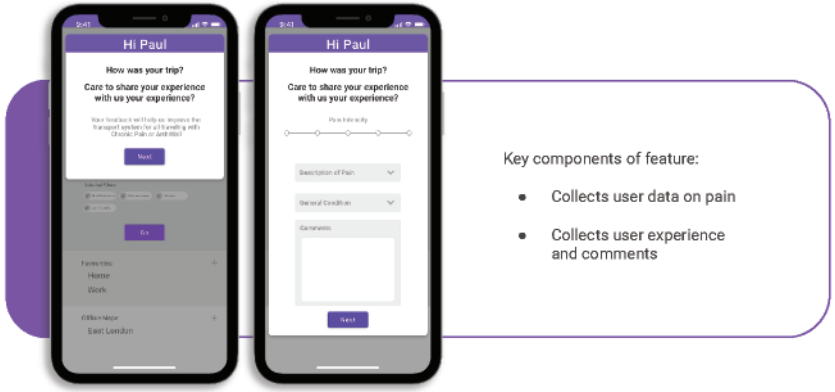
Travel feature using accessibility and accommodation filters



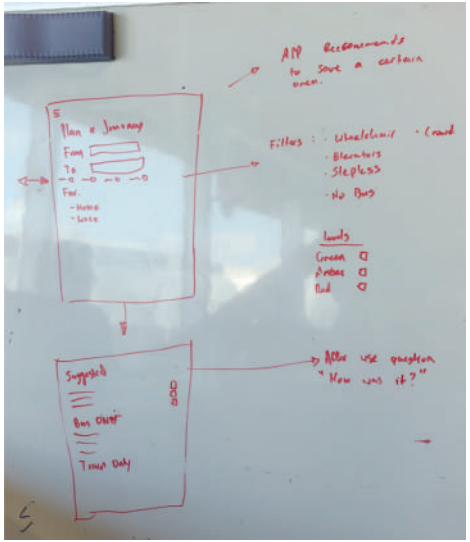
Original Ideation Sketch

PROJECT 1: DEVELOP

Prototype Feature 1: Travel



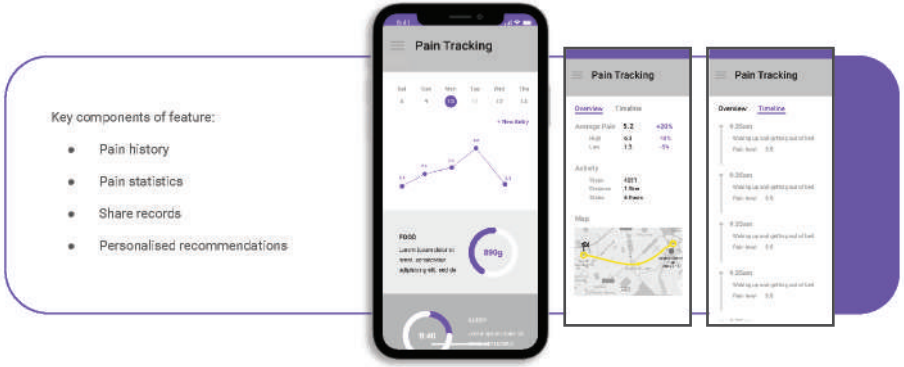
After journey Pop-Up for User feedback



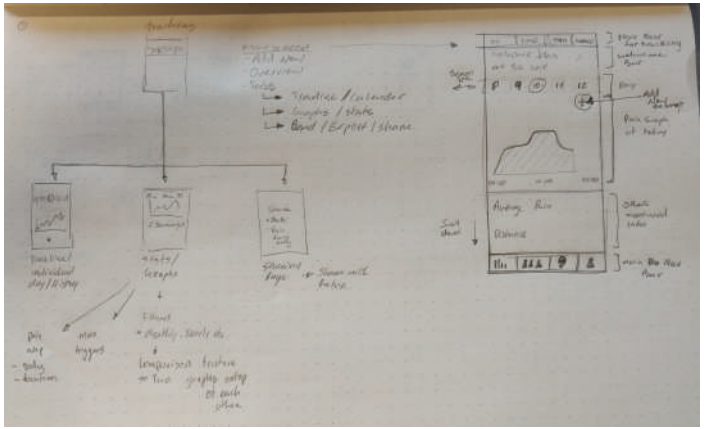
Original Ideation Sketch

PROJECT 1: DEVELOP

Prototype Feature 2: Pain Tracking



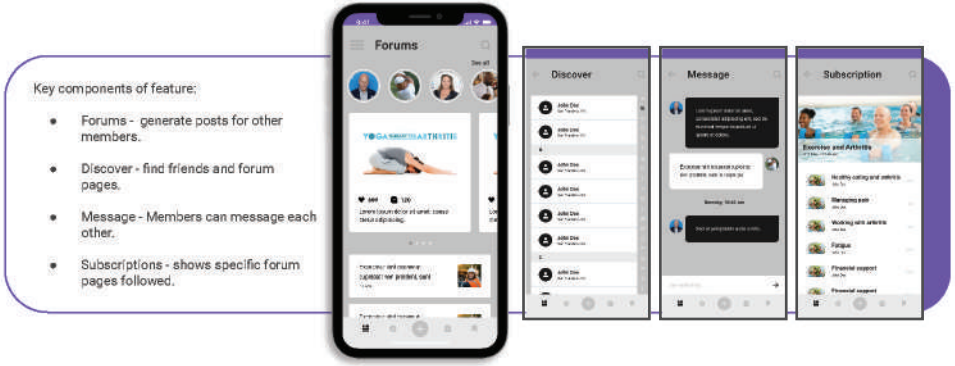
Pain tracking through collected travel data



Original Ideation Sketch

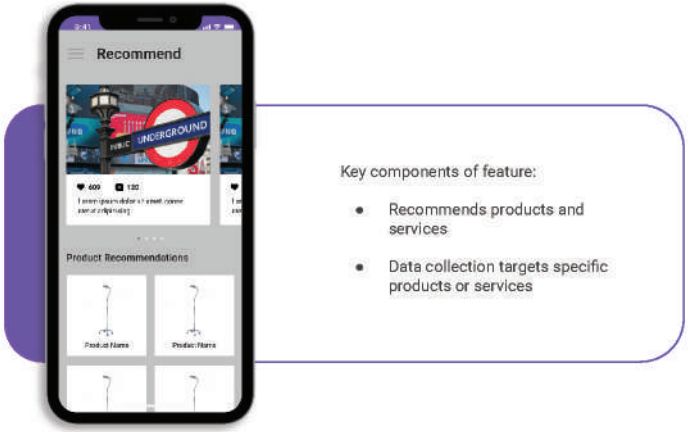
PROJECT 1: DEVELOP

Prototype Feature 3: Forums



Forum and messaging feature for connecting users

Prototype Feature 4: Recommendations

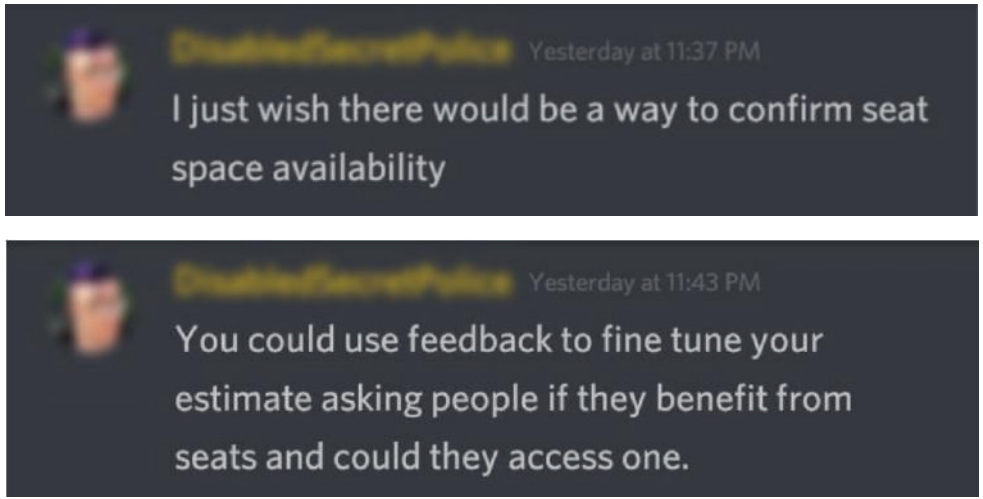


Recommendations based off user data

PROJECT 1: DEVELOP

User Test Feedback

(Tomiwa)
The prototype was shared with potential users on online forums and social media groups in order to get user feedback on the features. I interviewed the users online after they tested the prototype. Some of the most notable feedback is below:



14m

From a friend: "But it looks really great overall! One thing I might add (idk if this is feasible so just ignore me if it's not) is a note of if a place (airport, subway station, etc) has service dog relief rooms and where they are located. I know lots of people use service dogs for chronic pain conditions and need to budget energy accordingly when searching for places to relieve them. Other than that, it looks great. If you want accessibility testers later on let me know"

1m

I love this idea. I have Psoriatic Arthritis, Fibromyalgia and IBS and would love to know what I'm getting myself into when traveling. Also, bathroom locations are ideal when traveling with IBS!

PROJECT 1: DEVELOP

User Test Feedback

[redacted] 56m

Something that might be cool to add would be the number of staircase steps. For canadian subways (ei:tube/metro) it says the number of steps at the bottom of every staircase. Its useful to increase use of stair to stay healthy but in this case could be a great source of info for you app. Check out the "societé de transport de montreal website". They are very transparent with data

[redacted] 2h

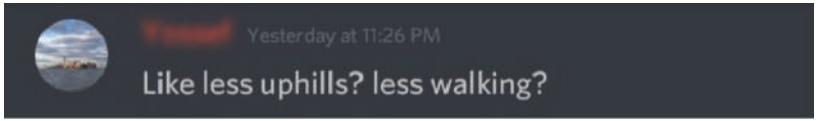
It'd be cool if people just select what disorders or mobility issues they have problems with in the app and see what places can accommodate them? I have issues with my hands and knees because of osteoarthritis, so it'd be really helpful to see places that would be able to accommodate my mobility issues. But otherwise, it seems really good and I'd definitely use it.

[redacted] 2h

For me personally, knowing if places have a lot of stairs would be really helpful to me since I have difficulty with that. Another really big one is how accessible are hotels. It'd be super helpful to have pictures of accessible hotel rooms and a list of accommodations that they can actually do.

[redacted] 23m

Hi, I'm just wondering if you have thought about maybe including a section so that users can inform you if there is an issue with a route. As someone with chronic pain there is nothing worse than putting yourself through hell to get somewhere only to find out that you can't actually get to your final destination.



PROJECT 1: DEVELOP

Future Iterations

(Tomiwa)
From the feedback of user tests I conducted the team recommended the changes below for future iterations. Unfortunately, they could not be implemented in the short production time.

- Allow users to report issues with transport route

- Show if stations have bathrooms for sufferers with IBS

- Filter by pet-friendly stations so sufferers with service pets can easily find them

- Recommend routes based on type of chronic pain

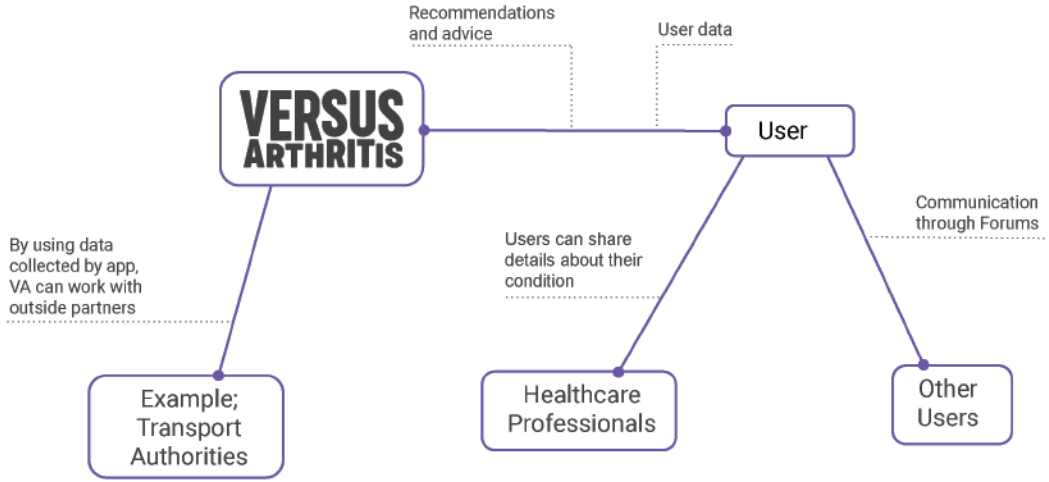
- show the number of steps at each station as sufferers seem to know their personal limits

- Taxonomies (lists of vocabularies used in the app) for all sufferers who are not educated on their conditions

PROJECT 1: DELIVER

Business Case

(Farida)
As part of the project deliverable, apart from the prototype and user data, the team also presented a business model, production timeline, SWOT analysis and stakeholder map for the app.



Stakeholder Map showing how the app connects stakeholders

PROJECT 1: DELIVER

Business Case: SWOT Analysis

Strengths

- Community - Connects people
- Personalised feedback
- Increases travel efficiency (user can use filters)
- Advises users how to reduce pain when travelling
- Helps user understand their condition better

- Collects data for Versus Arthritis.
- Helps generate ideas and inform VA how to prioritise investment.
- Provides a platform Versus Arthritis.

Weaknesses

- Data Security
- Adoption
- Cognitive load, there are a lot of features to navigate
- Get accurate and consistent feedback
- Competition (differentiating the app from others)
- Limited to London

Opportunities

- Help VA understand the users needs/conditions better
- Gives Versus Arthritis a direct touch point to many of the people they are trying to help
- Can provide a base platform from which to launch more features to help VA and the users.
- Possible collaborations with other companies like Uber and Fitbit.

Threats

- Some users may not want to change from their preferred map applications.
- Privacy Regulations
- Revenue generation
- Competition (differentiating the app from others)

PROJECT 1: DELIVER

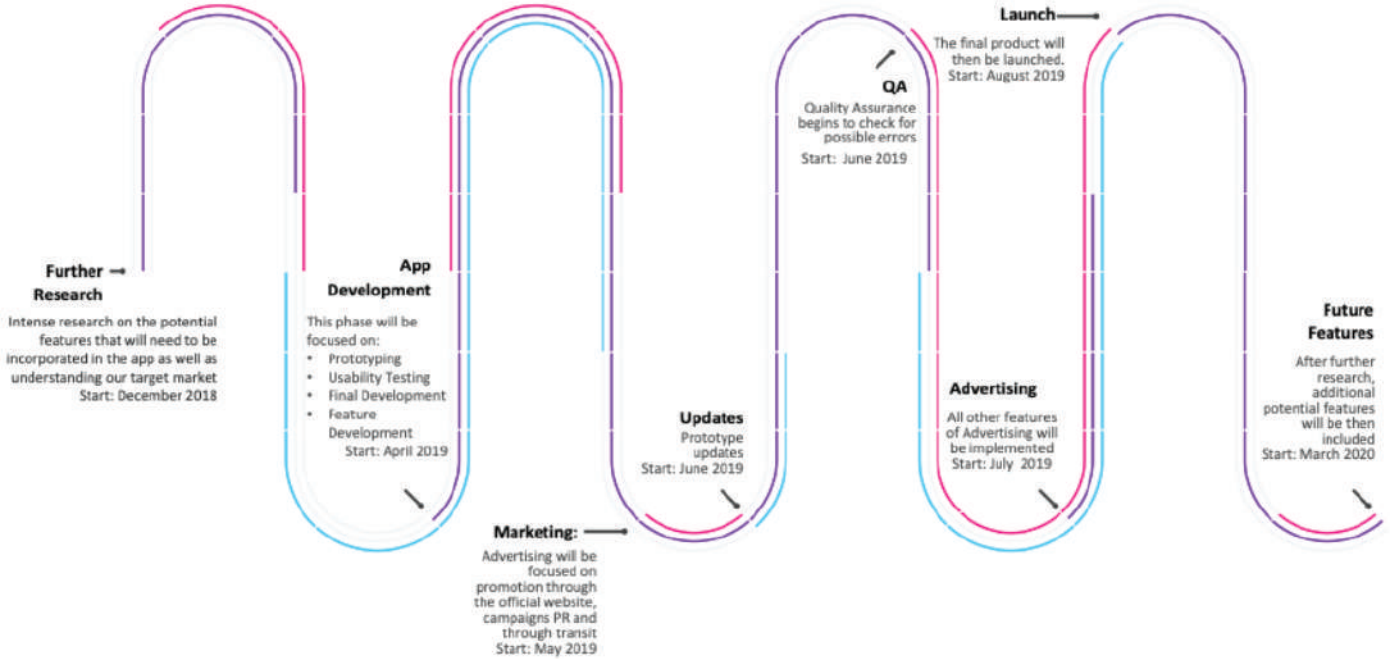
Business Case: Business Model Canvas

Key Partners	Key Activities	Value Proposition	Customer Segments	Customer Relations
Information for easy travel will be gotten from Transport for London. The recommendations offered, will be received from medical and healthcare professionals.	Through customer feedback, the app will frequently undergo updates and improvements to maintain the quality we aim to provide our users. **Key Resources** Main key resource will be the startup capital that will aid the development and launch of app.	Our service promises to provide the easiest, fastest and cheapest travel route that would help reduce the pain, our potential users suffer on a daily through the use of public transport. Asides from the fact that majority of our targeted users suffer financially, most of them experience a lack of empathy from their surroundings and have insufficient knowledge on their condition. This led us to incorporate forums, a tracker for pain and recommendations for useful services and products that can help improve their ailment.	We aim to attract an audience that rely heavily on public transport to commute and that is, majority of working class and students. **Distribution Channels** Mainly through the help of social media and transit advertising, our users can gain knowledge on how to access the app, which will be available in app stores for both iOS and android users.	The online profiles our customers create allow us to provide customised services to each user. This stimulates a personal relationship between the product and user. Also, with the creation of online communities, information can be gathered to have a better understanding of the needs and wants our customers desire.

Cost Structure	Revenue Streams
Research and development will have a substantial amount of financial investment as well as the different aspects of promotion required. With a budget of 75,000 – 150,000 pounds, this app can continue to maintain and develop existing and new features for the users.	The purpose of this service is to provide a free yet beneficial experience for users. So, revenue will mainly be gained from ad streams that non-users will have to view from time to time in order to gain access to the limited services provided for them. In the near future, revenue will additionally be attained from potential partnerships that will be featured on the app.

PROJECT 1: DELIVER

Business Case: Production Timeline



PROJECT 2

Project Task:

Tasked with undertaking a self-driven long term project in any design media for our Senior Project, my friends and I from Carleton University decided to delve into the world of Virtual Reality. We were interested in exploring a project with VR because of how new and exciting the technology was at the time as well the prospect as challenging ourselves with something we hadn't done before.

Span: Sep. 2016 - May. 2017

PROJECT 2: TEAM MEMBERS & ROLES

Mark

AI Dev
Interaction Dev
Interaction Design
SFX

Eric

Team Leader
Interaction Dev
Interaction Design
User Testing
Audio

Tomiwa

User Testing
Designer
Lead Modeller
Animator
Story/Concept

Akito

Level Designer
Level Dev
Modeller
Audio

Patrick

Audio
Interaction Dev
Game Mechanics
Designer

PROJECT 2: TOOLS

Game System and Engine

The system chosen for the game was the HTC Vive as one of our members owned it and it was the most powerful VR system at the time with 1:1 position and rotation tracking and active haptic feedback. The game engine chosen was the Unreal Engine as it supported the HTC Vive and had fast compilation speeds, suitable for quick prototyping and iterations.

HTC Vive

Unreal Game Engine 4 (UE4)

PROJECT 2: DISCOVER

Secondary Research

With little documentation and best practices for the creation of VR games, our team had to do a lot of research to know what to expect and the best tools. Apart from research into the production process we also researched how people interacted and used VR.

Findings

UE4 Development (Mark, Eric, Tomiwa, Akito)
- Research into VR best practices and optimization for reduction of VR sickness.
- Research into implementation of VR audio in UE4 specifically haptic and spatial audio, attenuation and occlusion.
- Many VR games use Low Polygon art styles to meet the optimization requirements for VR consoles.

Immersion in VR (Eric, Patrick)
- Factors like freedom of movement, auditory, and physical/haptic feedback and satisfying interactions increase users' immersion.
- The presence of lag, glitches, and inconsistent visuals take users out of immersive experiences.
- Because of VR sickness, most users don't use VR systems for more than 30 minutes at a time.
- Many VR projects simulate freedom of movement using teleportation, vehicles and other techniques.

Research into 3D UI and VR interactions (Tomiwa, Eric & Mark)
- Research showed that interactions have to be understandable to a typical user, with easy to learn object manipulation techniques.
- Audio, visual and haptic feedback make VR interactions easier and more satisfying for users.

Key Findings

PROJECT 2: DEFINE

Since this was our own project we came up with project goals that would act as our problem statement guiding our design process

Project Goals

Based on our research we noticed the importance of immersion and decided to tackle some of them in our project. We constructed 2 goals to guide this endeavor:

1. **Innovatively use VR space**
   + Because of the limited walkable space, exploration and freedom of movement are difficult and often hinder immersion. How can we innovate use and expand this walkable space?

2. **Craft a well rounded introductory VR experience**
   + Satisfying interactions
   + Minimal virtual reality sickness

Target User

Our target audience consists of gamers seeking new experiences as these are the majority of people trying VR games. Their age range is 18 to 55. We want to craft an experience that makes these new users familiar with basic interactions in VR.

PROJECT 2: DESIGN

Concept Generation

We focused on our first goal when generating ideas for our game. We came up with many different concepts on how to expand usable space in VR, such as:

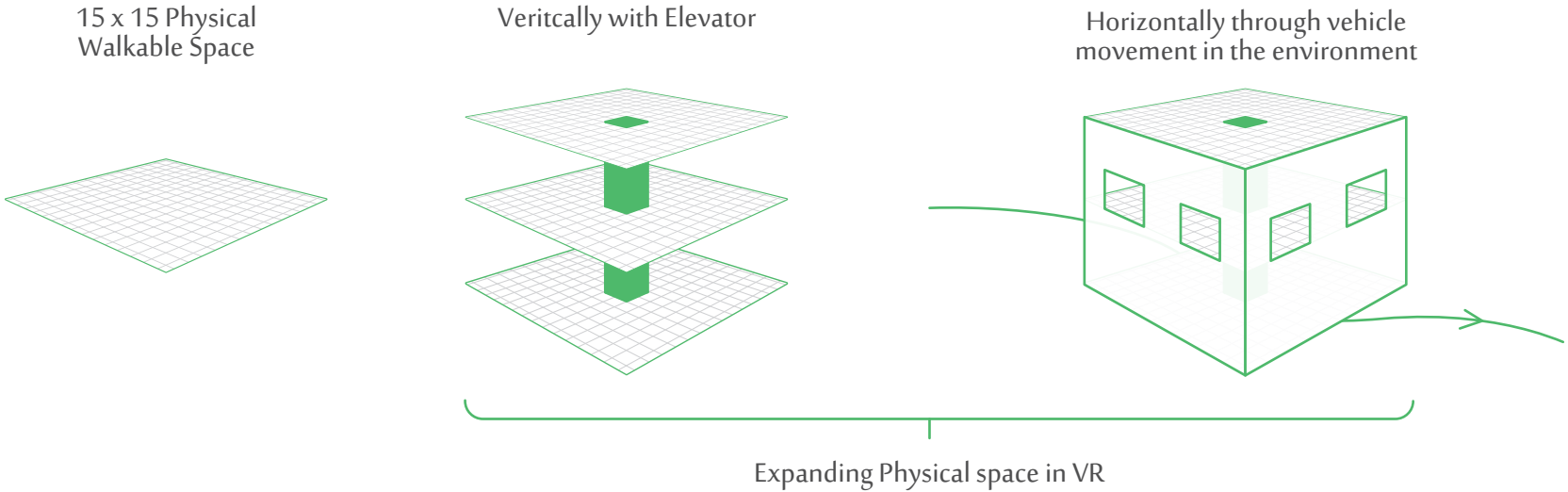
Concepts
- Elevator to different gameplay levels
- Terrestrial exploration ship
- Phone-based AR shooting game
- AI procedurally generated environment
- Teleportation shooting game
- Rocket pack for exploration
- Moving platform representing the physical space
- Portals to new gameplay areas

After discussion, we decided that a combination of the highlighted ideas would best serve our goal of expanding usable space.

PROJECT 2: DESIGN

Concept

A VR game where users explore an alien planet with a terrestrial space vehicle. The ship would act as the 15 x15 walkable space provided by the HTC Vive. The user uses the ship to traverse the VR world horizontally while they use an elevator to move horizontally in the ship.



PROJECT 2: DESIGN

Features

For the second goal, we needed features for the game that would act as the VR interactions we would design and develop. We brainstormed essential, planned and optional features. After prototyping user testing many of these features were changed or even omitted from the game.

Essential Features
- Moving ship
- Elevator
- Manned turret for engaging enemies
- Digital Assistant for Vehicular Exploration (D.A.V.E) a simulated A.I. that assists the user by giving directives for tasks.
- Ship movement
- Lowpoly art style
- Interactable Repairable components of ship (e.g engine, fuel cell, control console, and power generator)
- Hostile Planet aliens (Urks)

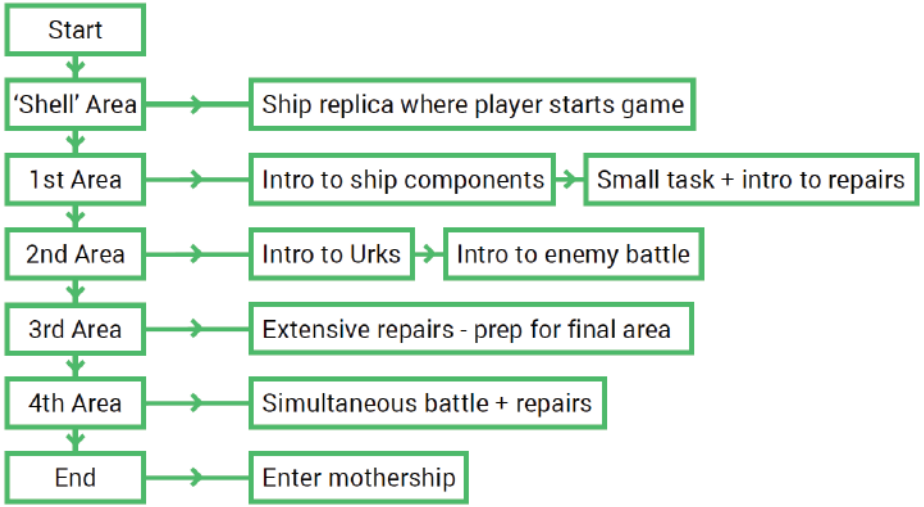
Planned Features
- Different environment section 4 total
- Climatic ending/escape
- 3DUI Contains map, component icons displaying status, throttle, tire treads
- Environment map to provide the user context related to progress
- Destructible environment assets
- Aesthetically pleasing surrealist skybox
- Teather SelectionSystem
- Introductory shell area to the game (menu/tutorial)
- Information bars on control panel

Optional Features
- Radar system
- Multiple tire treads types suitable for different environments
- Deeper substory
- Repair tools
- Cooling system for ship maintenance
- Turret customization
- Easter eggs

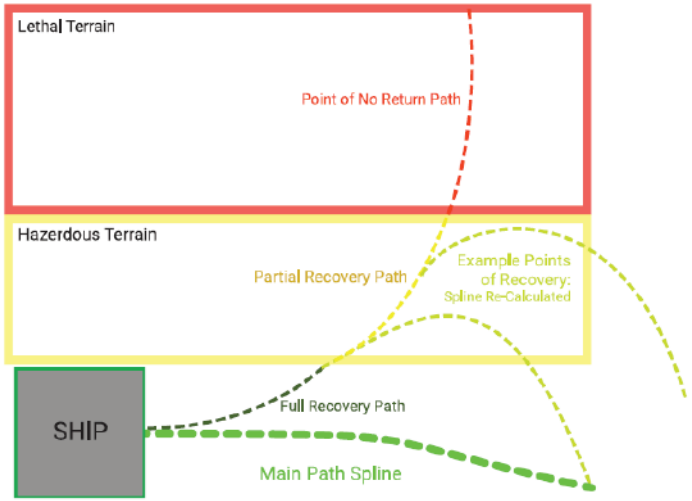
PROJECT 2: DESIGN

Initial Designs: Gameplay

We charted out the gameplay progression of the game. It was made up of interactions that involved repairing the ship and using an onboard turret to fight alien enemies (Urks). The ships would move on a fixed path and would go off track when it takes damage. By fixing it the user can bring it back on track.



Gameplay Events

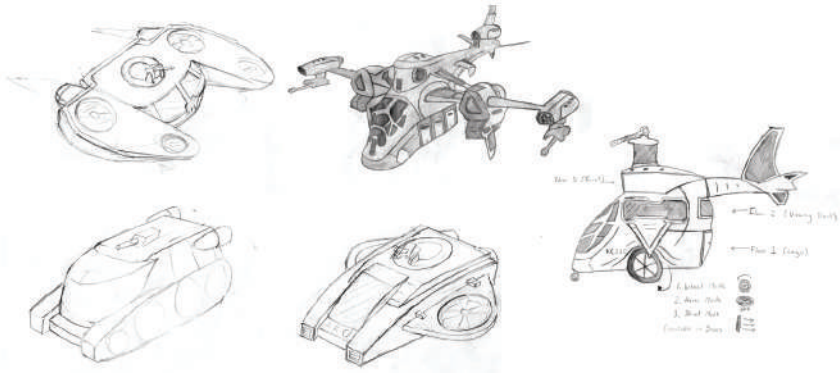


Ship Repairs and Path

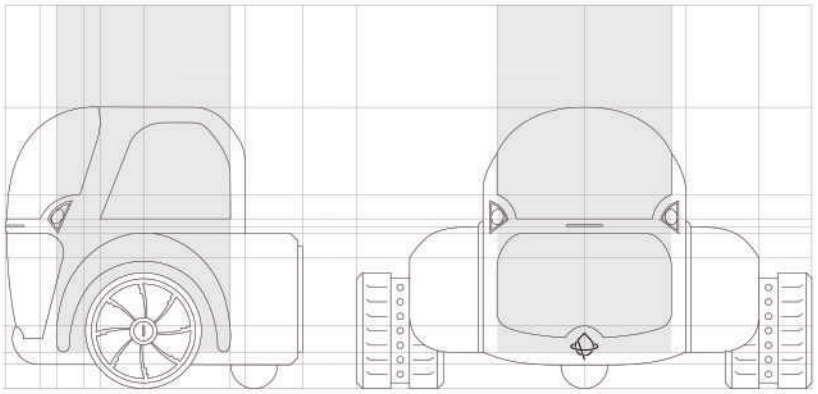
PROJECT 2: DESIGN

Initial Designs: Ship

Concept designs of the ship. The final design was made square-shaped to represent the walkable space.



Original Sketches (Tomiwa, Akito)

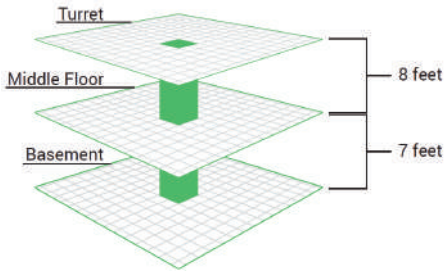


Final Concept design for Prototype (Tomiwa)

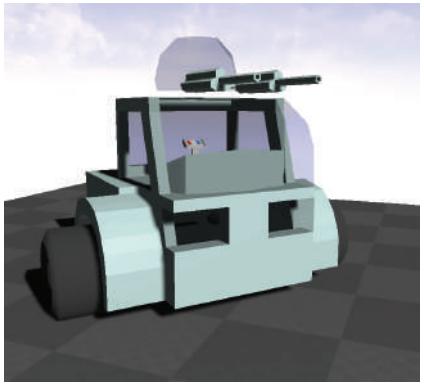
PROJECT 2: DESIGN

Initial Designs: Ship

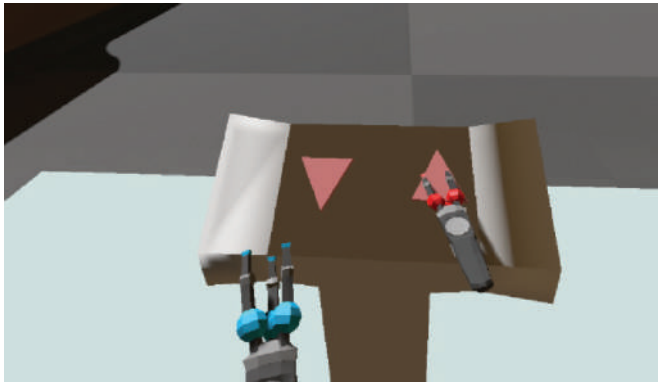
3D prototype of the ship with a working elevator and turret. The proxy was based on the size and the shape of the physical walkable space for realism and immersion for the user.



Ship Floors



Ship Prototype (Tomiwa)

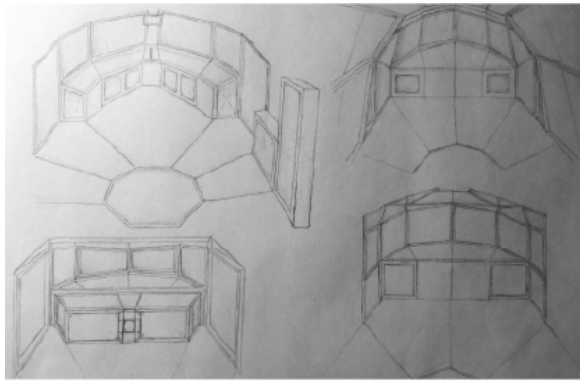


Elevator Prototype for navigating floors (Eric)

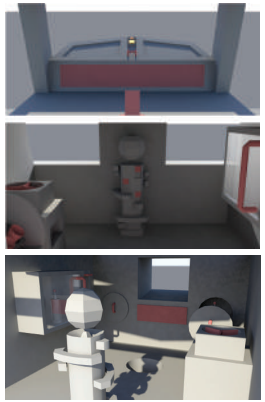
PROJECT 2: DESIGN

Initial Designs: Ship Interior

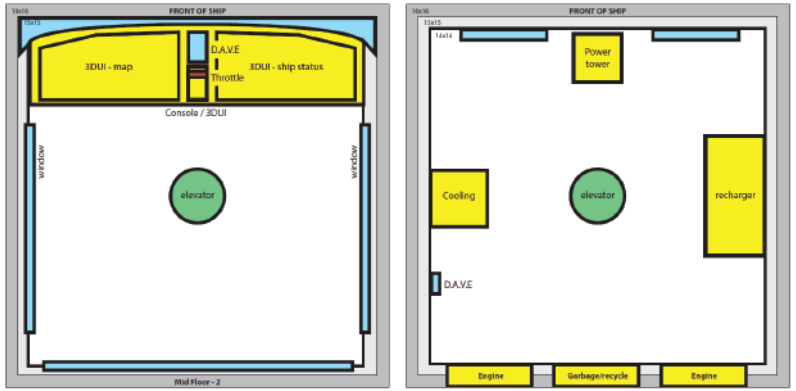
The interior of the ship was designed with the necessary components of the game and they were mapped out to take as little of the walkable space as possible. I made the 3D models for the prototype.



Interior Ship Concepts (Patrick)



Interior Ship 3D proxies (Tomiwa)

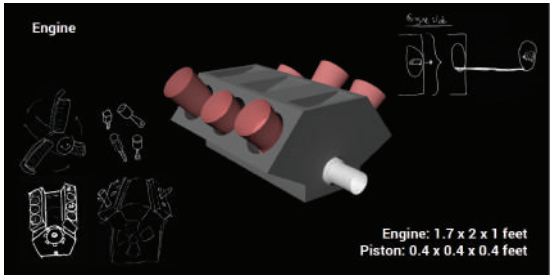


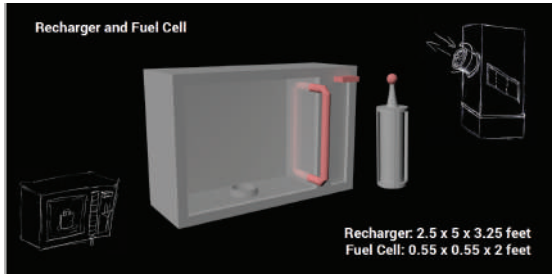
Interior Ship Layout (Eric)

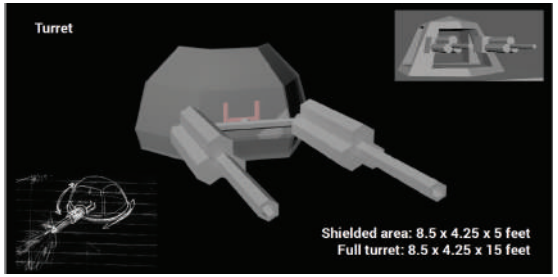
PROJECT 2: DESIGN

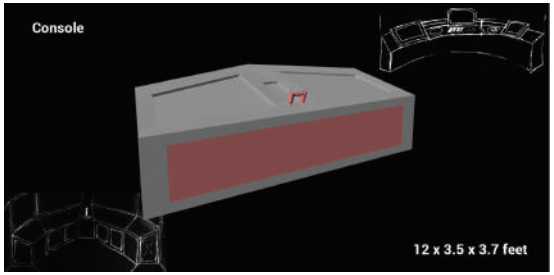
Initial Designs: Ship Components

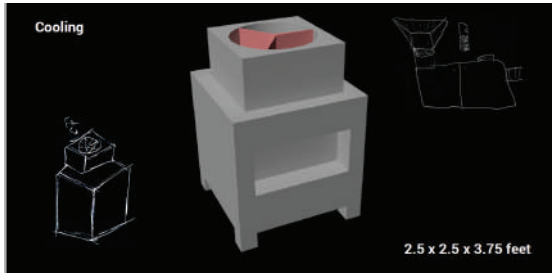
(Tomiwa, Eric, Patrick)
The ship components were conceptualized by the whole team but Patrick and I sketched the initial designs. Eric and I made the proxy models for the prototype.

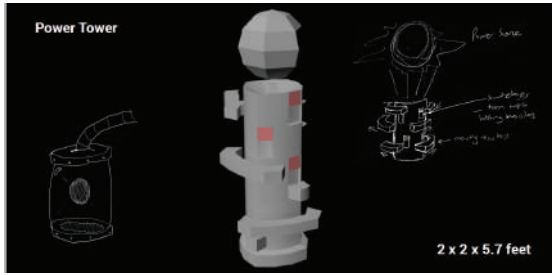












PROJECT 2: DESIGN

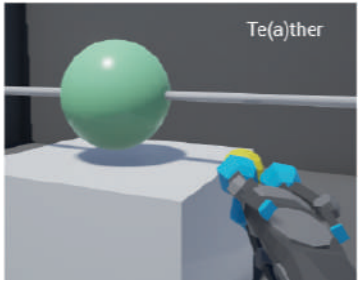
Initial Designs: Interactions

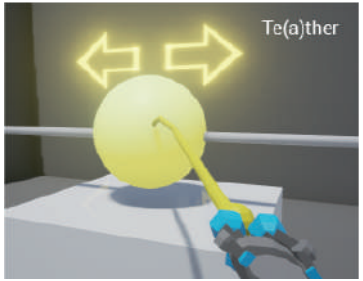
(Eric, Mark)
2 interaction methods were conceptualized:

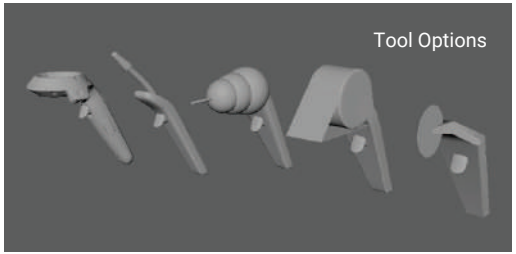
- **A "Vive Claw" hand for 1:1 selection and manipulation**: This would represent the player's controllers. Originally, designed to become different tools but we found the amount of options was too much for new users.

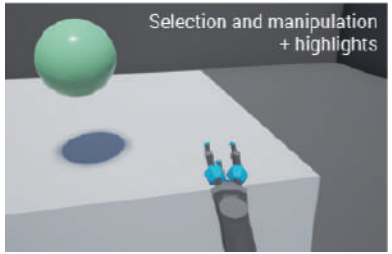
- **The "Te(a)ther Ray", an elastic ray for ranged interactions:** This was discarded as none of the interactable components would be at a long-range. Also, we found that it wasn't intuitive as it didn't represent a real interaction.

Vive Controller Vive Claw





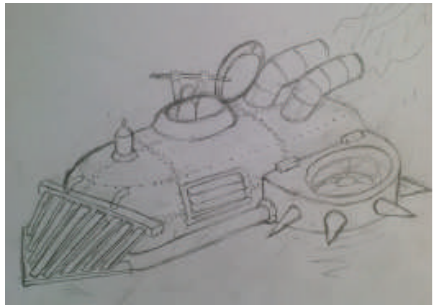


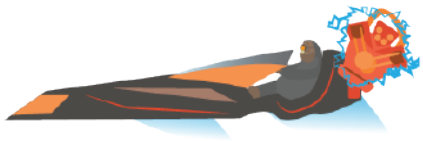


PROJECT 2: DESIGN

Initial Designs: Character Design

(Tomiwa, Mark)
Many concepts were made for the Urks (the alien enemies in the game) and their vehicles, but the final models were not made in time for the first prototype testing stage.



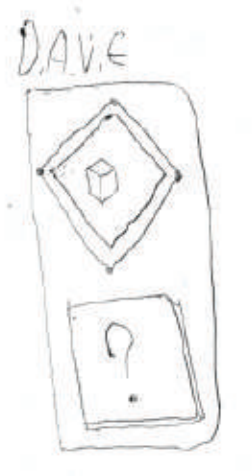


PROJECT 2: DESIGN

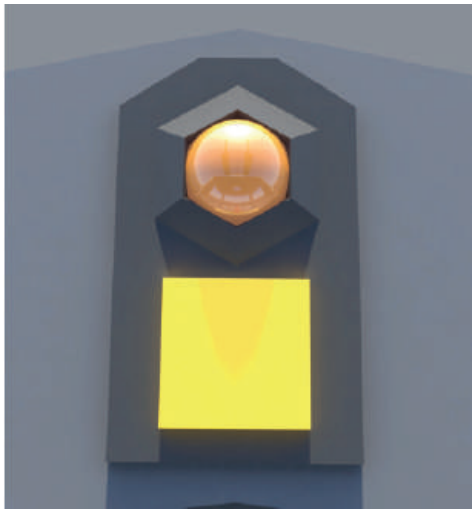
Initial Designs: Character Design

(Mark)
D.A.V.E. (Digitial Assistant for Vehicular Exploration), the users onboard helper, was designed with HAL 9000 from the film "2001: A Space Odyssey". In the film, one of the characters names is actually Dave.

Inspiration



Original Sketch

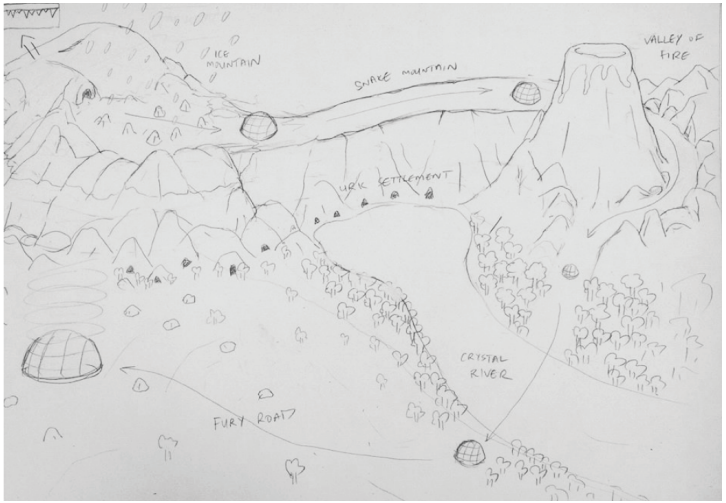


Concept Render

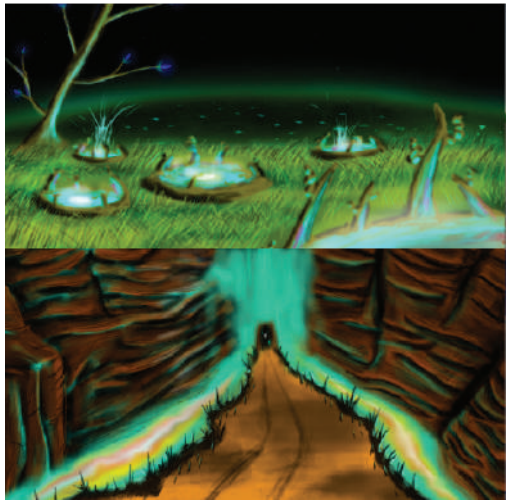
PROJECT 2: DESIGN

Initial Designs: Environment

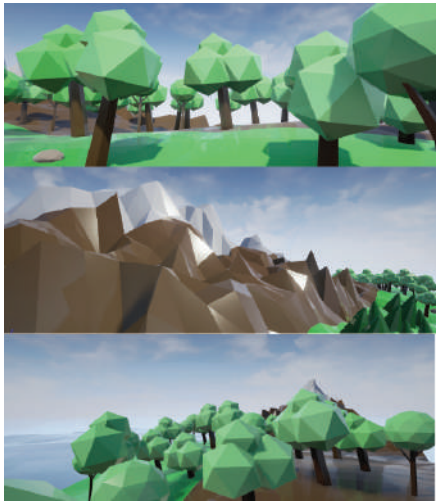
A low-poly style was chosen because it's less computationally expensive than more realistic styles. The colors were made vibrant and to enhance feelings of presence and surrealism. I planned the layout of the map so that the world edges could never been seen by the user.



Environment Layout sketches (Tomiwa)



Concept Designs (Patrick)



Low-poly Visual Style and Concept Renders (Akito)

PROJECT 2: DEVELOP

User Test 1

Tomiwa conducted the initial user tests with 14 users. This test focused on the design and functionality of the ship's elevator and turret in their proxy states.

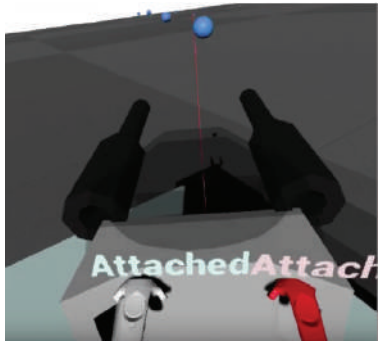
Test Goals

- Compare two types of turret: Large (2 DOF) & 3 Small (3 DOF)
- Observe + evaluate turret interactions
- Attach/detach, aiming, satisfaction
- Determine if users could use the elevator with ease
- Evaluate user comfort on the elevator

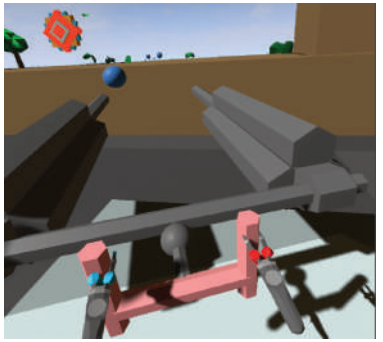
Test Tasks

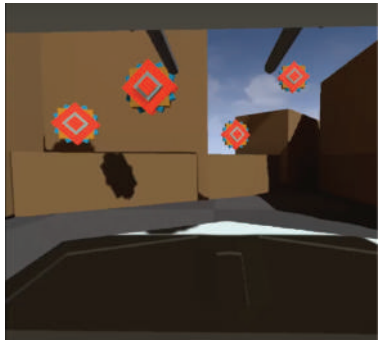
- Show user where “grips” and “trigger” are on the controller
- Tell user to “go to the top floor”
- Tell user to “attach to the turret using grips”
- Tell user to shoot all targets
- Tell user to “detach from the turret”

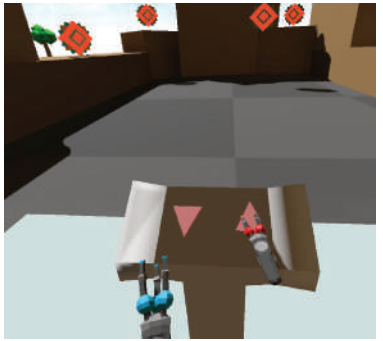
Note: Users were asked to think aloud during the test. Post-test survey given and short informal interview was conducted afterward.



Small Turret


Big Turret


Ship Interior: Middle Floor


Elevator Top Floor

PROJECT 2: DEVELOP

User Test 1: Findings

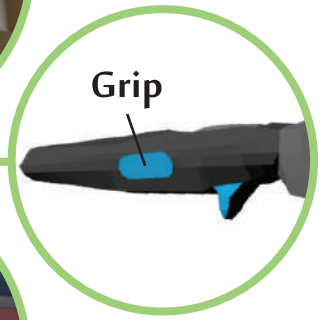
(Tomiwa)

Elevator

- Elevator arrows need to be vertically aligned. Currently, they look like forward and backward not up and down.
- Elevator shows no indication of what floor users are on

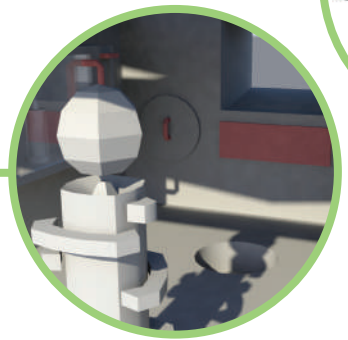
Guns

- Grip buttons are unintuitive for attaching and detaching from turrets
- Large turret was more satisfying than the small turret because the size/appearance made them feel cooler and more powerful
- Attaching and detaching to the small turret had to be precise because of the small size, making it harder.



General

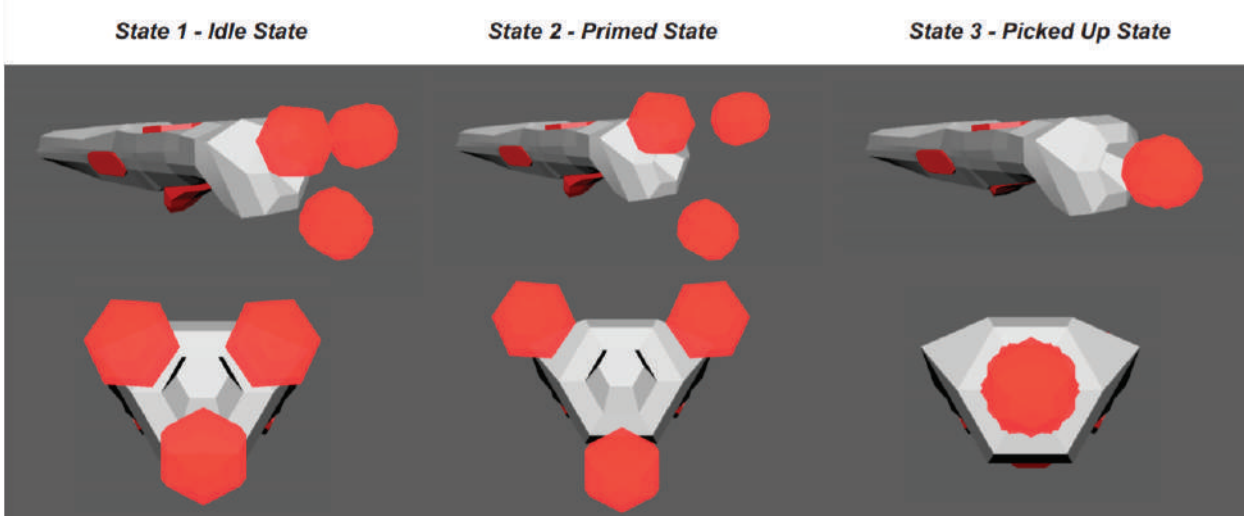
- Affordances and feedback needed for both the elevator and the turrets
- Most users found the ship interior claustrophobic
- Users had to move closer to the turret to attach or they would accidentally pressed the elevator.



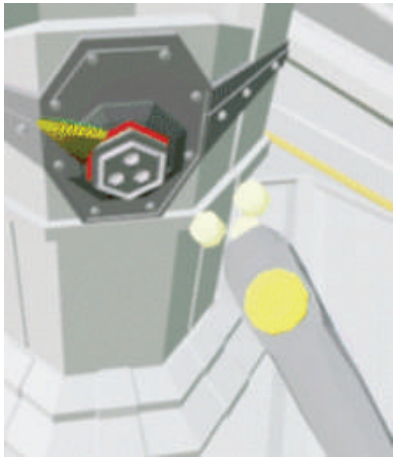
PROJECT 2: DEVELOP

User Test 1: Design Changes

3 major changes were made based on the findings of user test 1:
- The elevator was redesigned to translucent and completely vertical so up and down was clear. (Tomiwa)
- Vive claw was designed to be more intuitive. It was now made of 3 orbs (coined keyhole) that come together with a trigger press. (Eric)
- This keyhole motif was then used to show affordances throughout the game, for example on the turret. (Tomiwa)



Controller Interaction Redesign



Controller Affordance Example

PROJECT 2: DEVELOP

User Test 2

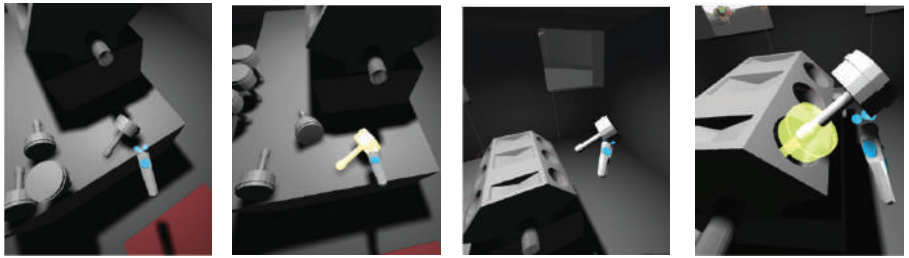
Tomiwa and Eric conducted the 2nd test with 24 users. This test would evaluate our first working component,, the engine, also well as iterated versions of the turret and elevator. The turret attach and detach was changed to the face button instead of the grip for this test. Only the big turret was used. We also collected info on the appearance of the Urks who, although not functional, were added to the game as targets.

Test Goals

- Evaluate new elevator iteration
- Observe & evaluate early engine prototype
- Evaluate new turret iteration (Big turret + new affordances)
- Observe & evaluate shooting while moving

Test Tasks

- Tell user to "go to the bottom floor"
- Tell user to "repair the engine"
- Tell user to "go to the top floor"
- Tell user to "attach to the engine"
- Tell user to "shoot enemies then detach from the engine"



Engine Repair Task (designed by Eric & Mark)

Urk Model (Tomiwa)

User Testing photos (Akito)

PROJECT 2: DEVELOP

User Test 2: Findings

(Tomiwa & Eric)

Elevator

- With translucent vertical elevator buttons, users didn't have depth cues and found it hard to press.
- Elevator needs depth cues, floor indicator, and feedback

Turret

- Some users found it tasking having to need both arms to operate and control the turret.
- Problems engaging and disengaging the turrets. Face button wasn't very intuitive for interaction
- Aiming is not very easy because users try to aim at the center of the 2 turret barrels.

General

- Users find object manipulation unrealistic and needs to be more robust (two-handed passing)
- Controllers should have feedback for pickup states
- Some users don't know which component is which. This seems to be because they are out of the user's view when mentioned.

PROJECT 2: DEVELOP

User Test 2: Design Changes

- Pick-up interactions were made more robust allowing users to manipulate objects with both hands. (Eric)

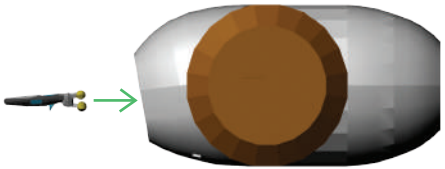
- Guns (Turret) Redesign (Tomiwa)
    - Turret split into two guns to solve the issue of needing both controllers to operate
    - Gun ends act as aiming sights for aiming problems
    - Gun comes with holster used to solve attach and detach problem

- The elevator was redesigned (Eric)
    - The new version was opaque and titled once again for easier depth perception
    - Clearly showed which direction the user was moving and what floor they were on.
    - Haptic, audio and visual feedback was added to elevator button press

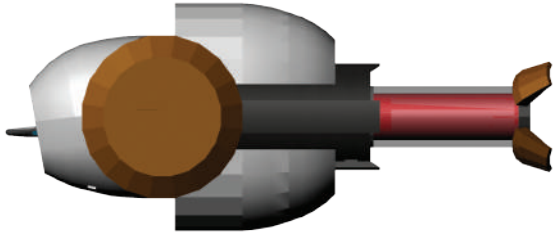
Elevator Iteration (Eric)

PROJECT 2: DEVELOP

User Test 2: Design Changes

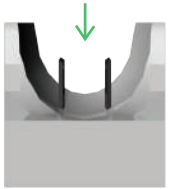


Closed State
- Placed in holster
- Needs Charge/Not In Use



Open State (In Use)
- When removed from holster
- Offers 6 degrees of freedom

Affordances
- Attach affordance
- Charge affordance



Holster
- Used for detach
- Charges gun

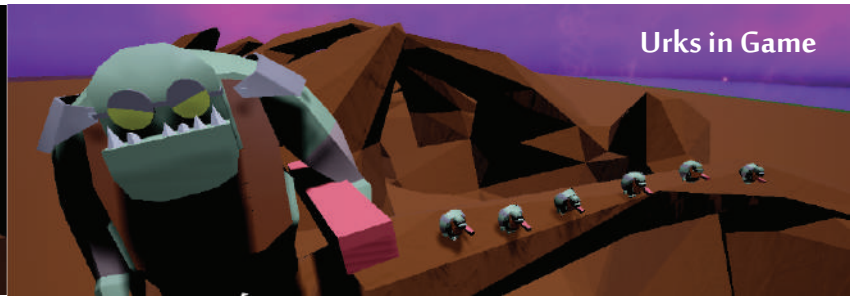
Gun Redesign (Proxy Model & Animation by Tomiwa)

PROJECT 2: DEVELOP

Alpha Designs

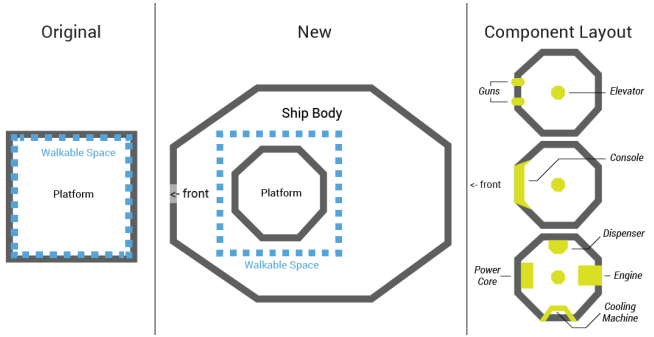
After the 2nd user test, we made a working Alpha prototype of the game, that encompasses the first 2 areas of the game. This came with many design changes:

- The ship underwent a massive design change which fully solved our claustrophobia problem. The shell of the ship was widened past the walkable space. (Patrick)
- Components were redesigned to replace the proxy ones. Many of them were made much bigger now because of the additional space. This made them more obvious for users. Additionally, they all made unique sounds encouraging users to look around. The Omni-dispenser was introduced, a new component that made the game less claustrophobic by freeing up the space that would be needed for a workbench. (Eric, Mark, Patrick)
- Environment layout redesigned. The first 2 areas, the skybox and most environmental assets were completed. (Tomiwa & Akito)
- Urk speeder models were completed and the Urks were added to the environment. (Akito)
- Audio Instructions for D.A.V.E. recordered and triggered by in-world events. (Eric & Tomiwa)

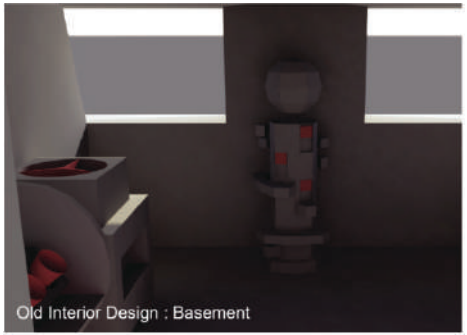


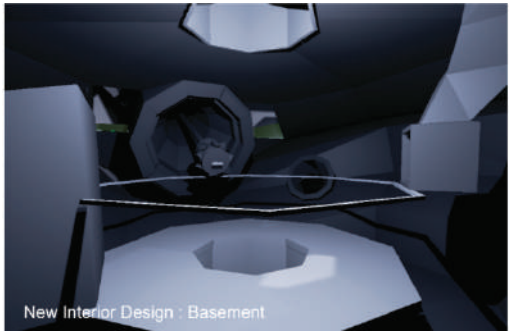
PROJECT 2: DEVELOP

Alpha Designs: New Ship Iteration

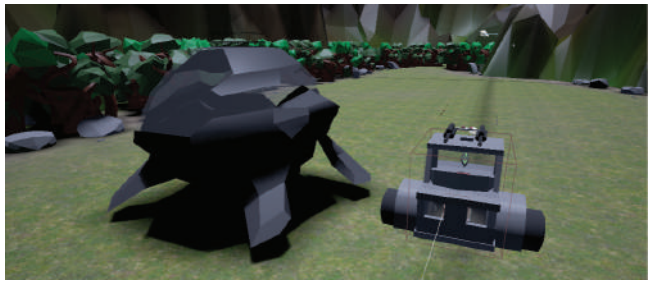


Ship Layout Redesign (Eric)





Comparing openiness in both layouts

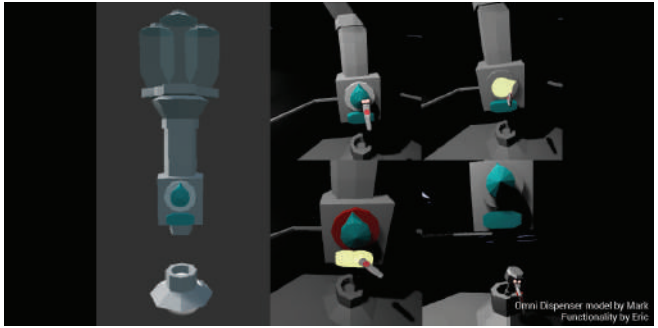


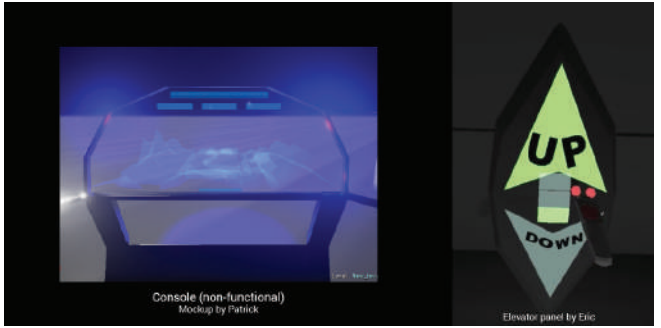
Side by Side Exterior Comparison

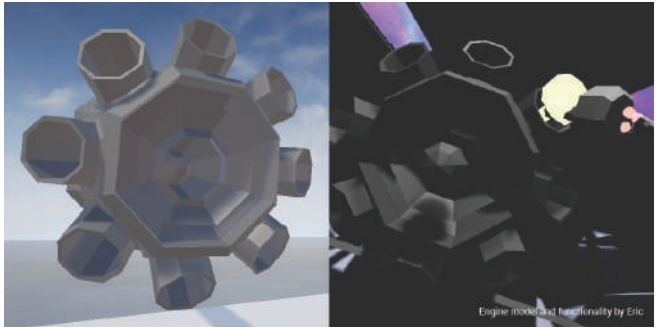
Exterior Ship Redesign (Patrick)

PROJECT 2: DEVELOP

Alpha Designs: New Component Iterations





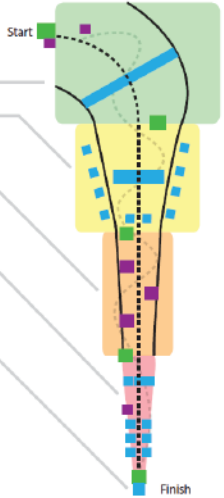


PROJECT 2: DEVELOP

Alpha Designs: New Environment Layout Iteration

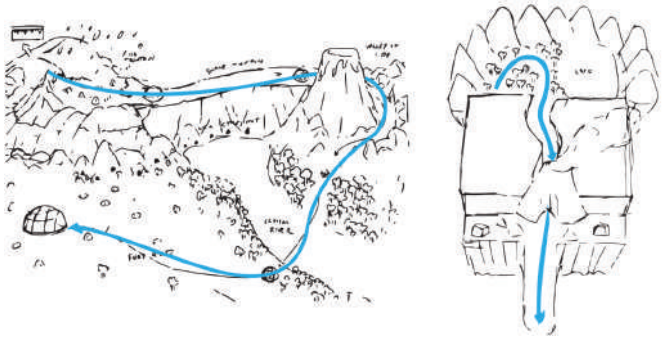
Areas
- 1: Beginning / "Fallen Tree"
- 2: Middle / "First Encounter"
- 3: Rest / "Preparation"
- 4: Climax / "Finale"
- Ending

Events
- D.A.V.E
- AI & Environmental
- Repairs

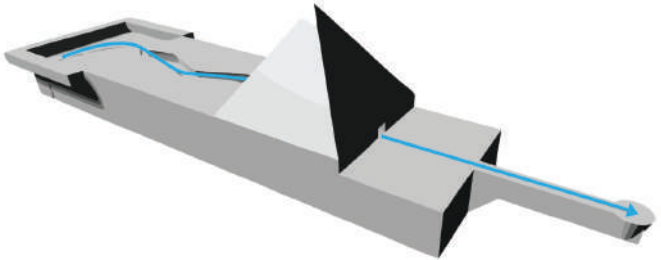


Hazards
- 1: Fallen tree
- 2: AI + narrowing walls
- 3: Very narrow walls
- 4: AI + cliff

Gameplay events paced with new world layout



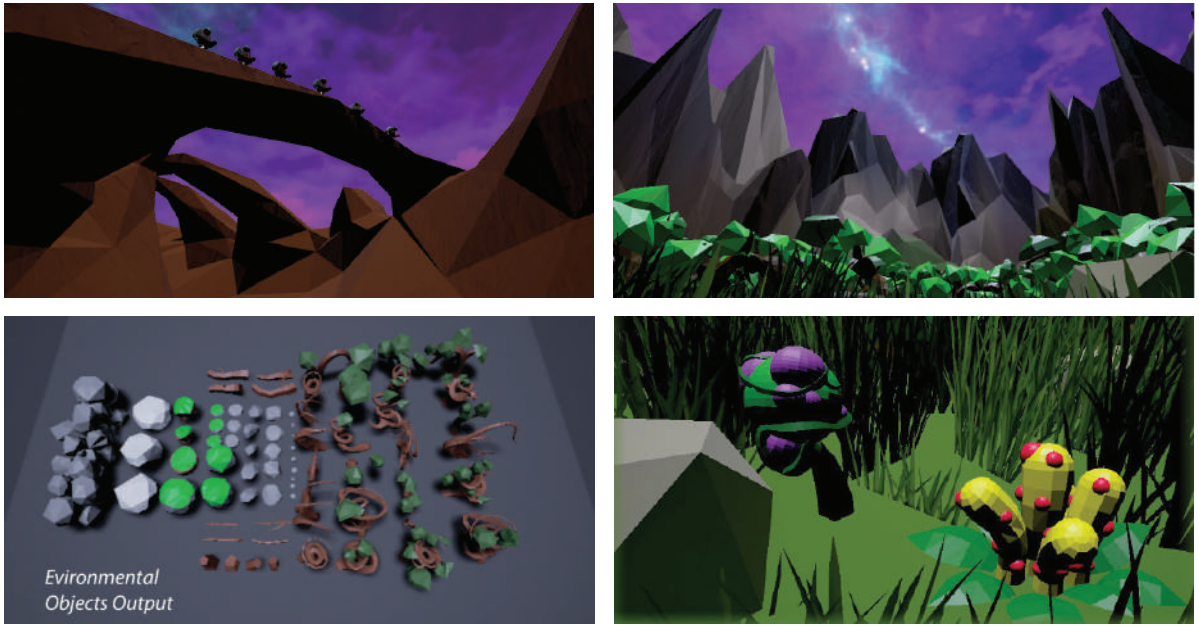
Old and new environment sketches (Tomiwa)



New layout proxy model (Tomiwa)

PROJECT 2: DEVELOP

Alpha Designs: Environment Design



Environment Assets (Tomiwa & Akito)

PROJECT 2: DEVELOP

User Test 3

Conducted by **Tomiwa** and Eric with 25 users. It consisted of users playing through the first third of the game (Alpha version).

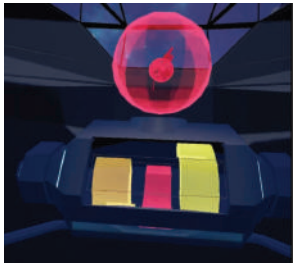
User Test 3: Findings

Item dispenser
- Users had difficulty operating knob because the were moving the position of their hands instead of rotating
- Dispenser button not immediately clear as users found text confusing
- Old items blocked the bottom of dispenser when users needed new items

Power tower (now Power Core)
- users did not understand how to use it, or what it was
- Electric sphere was distracting. People tried to interact with it instead of the part that needed repairs

Engine
- Users could not easily identify the engine.
- Users tried to shove the fuel cell into the engine.

Item Dispenser


Power Core


Engine

PROJECT 2: DEVELOP

User Test 3: Findings (contd.)

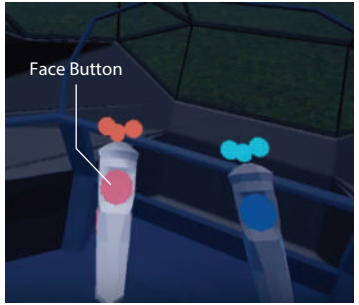
Guns
- From afar users couldn't tell when Urks were hit.
- Accidentally reattaching to holster because it was at the same level most users were shooting.
- Users could take guns to other floors and then couldn't detach from it.

Elevator
- Tons of accidental presses
- Users could not go straight to the floor they needed to in times of pressure

Ship
- Lacked detail and was not very immersive and made users want to focus on the outside when they should be focusing on the inside

General
- For many of the components (power tower and engine), users could not tell when they had repaired them
- Some users would try to use the face button for interactions which was no longer used in the game
- 3 users thought controller colors meant they were for different interactions
- Some components (gun & power tower) were at awkward heights for some users

Guns

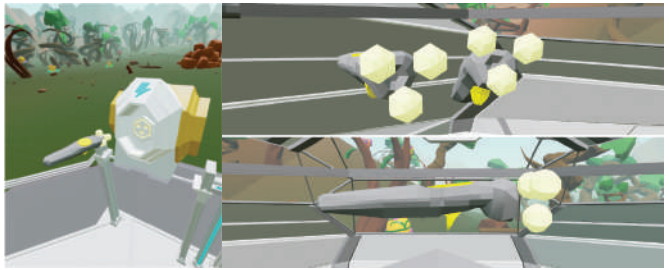


Controllers

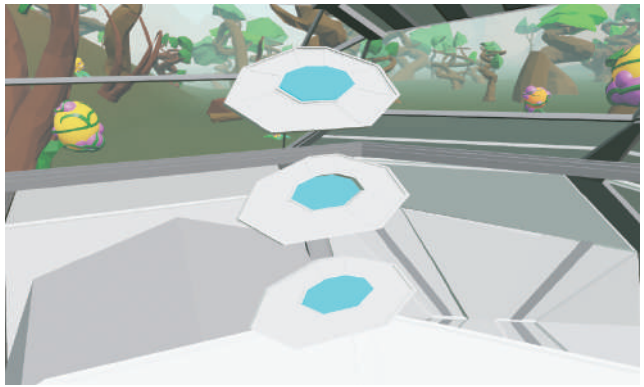
PROJECT 2: DEVELOP

User Test 3: Design Changes

General
- Controller colors were made consistent and the face button was removed so users don't try to use it. (Eric)
- Highlighting system was added to make interactions more clear. Affordances were lit the same color as the controller when users came close, showing it was interactable. (Eric)
- Made the working and broken states for components more different so users could easily tell when they were fixed. (Mark)
- All interactions were moved so they would be at an average height.



Elevator
- The elevator was redesigned to visually represent the 3-floors so that users could go directly to the floor they wanted. (Patrick)
- Elevator should become invisible when using guns to avoid accidentally pressing. (Eric)



Engine
- Engine retracts after repaired for user feedback. (Eric)
- Redesigned with fans to look and sound more like an engine. (Tomiwa)

PROJECT 2: DEVELOP

User Test 3: Design Changes

Power Core (Mark)
- Added affordances for controller insertion.
- The power core was oriented so the interaction was at eye level and more obvious.
- Lightning bolt iconography added for identification.

Item Dispenser (Mark & Eric)
- New dispenser removes old items so they don't block the passage
- Made smaller so the objects were at eye height and hand at knob height.
- Position instead of rotation for turning knob

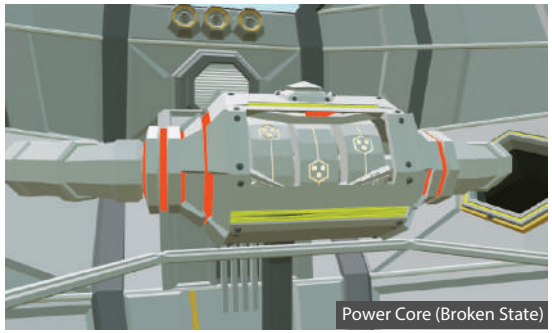
Fuel cell (Eric)
- Since users were already trying to put the fuel cell in the engine, we moved the fuel cell receptacle to the middle of the engine
- Add explosion particle effect for feedback when broken

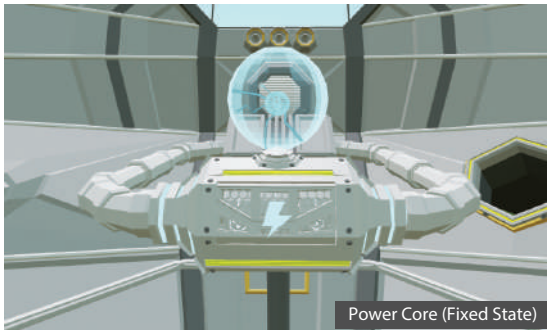
Guns (Tomiwa)
- Holsters automatically moved to the ground when not in use so users couldn't accidentally reattach
- Added the Wilhelm scream and explosions when Urks were hit as audio and visual feedback for the users

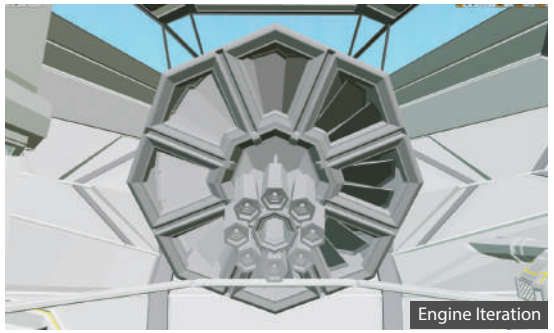
Ship (Tomiwa)
- Added more detail to the ships design. The inside of the ship was populated with miscellaneous ship panels. The ship's material shading was also changed so that the inside was fully illuminated.

PROJECT 2: DEVELOP

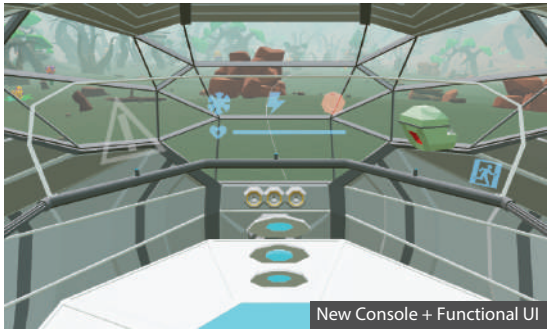
User Test 3: Design Changes (Ship & Component Iterations)

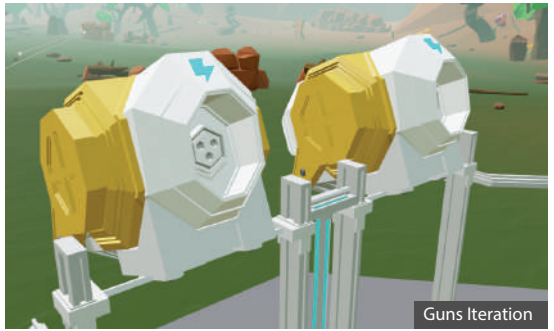

Power Core (Broken State)


Power Core (Fixed State)


Engine Iteration

Item Dispenser + Augmented UI


New Console + Functional UI

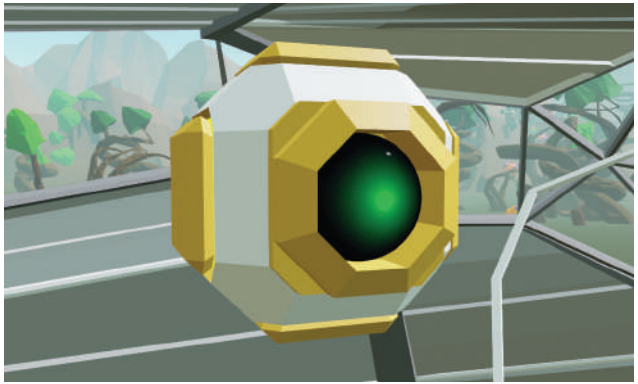

Guns Iteration

PROJECT 2: DEVELOP

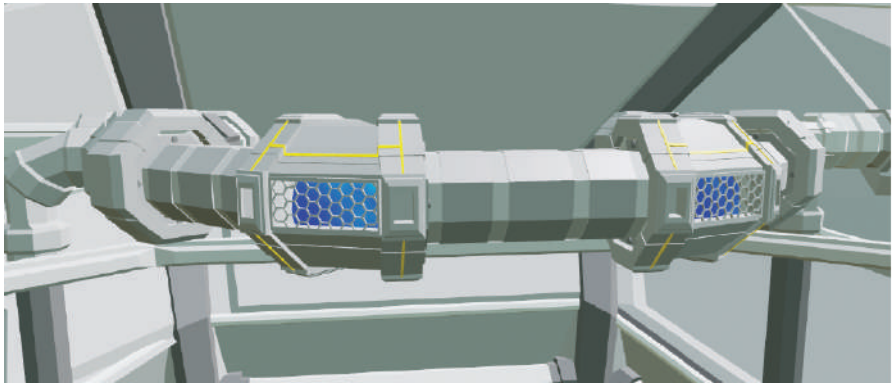
Beta Designs

We developed a fully working beta prototype for the final user test. There were a couple additional design changes at this stage:

- The cooling machine was introduced at this stage.
- D.A.V.E. was redesigned and now floated instead of being in one place, this way he could physically move to where the user was supposed to look at.
- The environment was made to be more consistent with itself. The first area was populated with beautiful plants and shootable rock structures. A new skybox was added as well.
- Urks are complete with AI and animation.



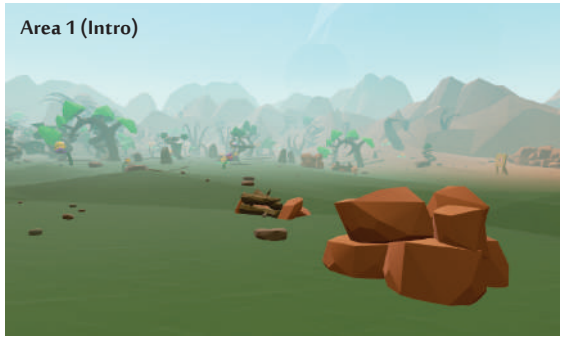
Floating D.A.V.E. Redesign

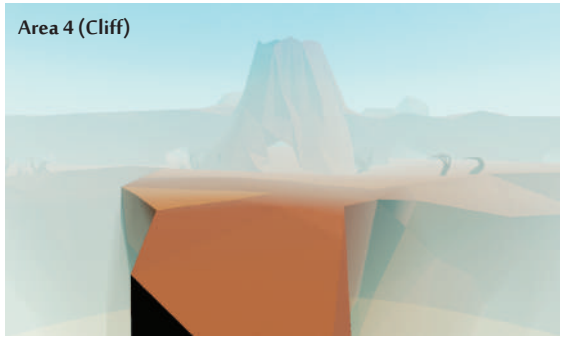


Cooling Machine

PROJECT 2: DEVELOP

Beta Designs: Environment





PROJECT 2: DEVELOP

User Test 4

The final round of user testing by **Tomiwa** & Eric was with only 4 people. This test was conducted to determine any remaining errors and to generate user feedback for small improvements. The main changes after this user test were:
- Elevator deactivation after item pickups so the elevator can never accidently be activated
- Adding an indicator to show users when the gun is charging.
- D.A.V.E instruction improvements
- Some event scripting improvements for gameplay pacing.




PROJECT 2: DELIVER

Senior Project Fair Demo & Presentation

Our team was invited to present the game at the Carleton Interactive Multimedia & Design Senior Project Fair. Below are photos Akito took of the event. Mark also made a website for the project that features a trailer that I (Tomiwa) made: https://teamflatearth.github.io/odysseyvr/




MULTIMEDIA PORTFOLIO

Wow! If you're reading this you made it through all 67 pages! If you're up for more I have another portfolio. This one focuses on all my other design skills including:

- Motion graphics
- Graphic Design
- Branding
- Illustration
- 3D Modelling & Animation

You can view this portfolio at:
tomiwaaina.carbonmade.com