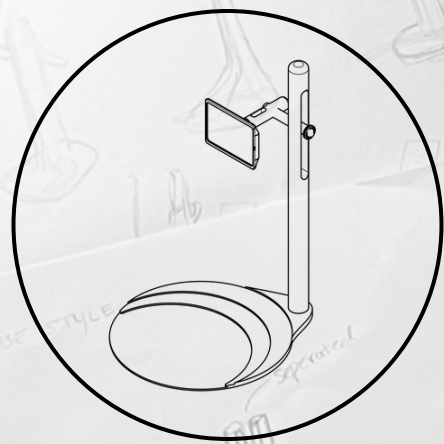




HEY MAN...



# SENIOR CAPSTONE

Erika Strazinsky / AU22

phila

Draw I don't know  
adjustment = NO  
the others  
All work, done  
double check  
to make sure

Place double the letter  
top

20-30  
BUDGET OF  
COST AT LEAST

grip on the base

stop in the base

KEEP IT SIMPLE  
BE FAMILIAR  
YOU WANT TO BE ABLE TO  
TEACH TO OTHERS  
STAND



# PROJECT ABSTRACT

## Surge Connect / A Tablet Accessory for Hyve-3D Engagement

Surge Connect is a tablet accessory designed specifically for Hyve-3D engagement. This iPad case and supporting stand aims at enhancing the user experience of the Hyve-3D; an immersive virtual reality system.

Surge Connect was developed in response to the creation of the Digital Public Participation Lab in Dominion Middle School, a living lab aimed at providing the community with a place to interact with emerging technologies, such as the Hyve. The Hyve interface works in conjunction with an iPad, where you can manipulate a 3D environment and create three-dimensional sketches. Because this is the first of its kind in the US, there is some hesitation and intimidation surrounding such a new technology. By targeting the iPad as the main touchpoint of the Hyve, the case and stand provides clear affordances as to how to interact with a three-dimensional cursor. The case allows for easy handling, signifiers for use, and an inviting aesthetic; while the stand provides an invitation into the Hyve as well as stability while sketching.

Creating an inviting atmosphere for the Digital Public Participation Lab begins with building infrastructure for what already exists in the space; empowering new users to step into an unfamiliar technology.

This book demonstrates the thesis concept, thought and design process as well as the product development.

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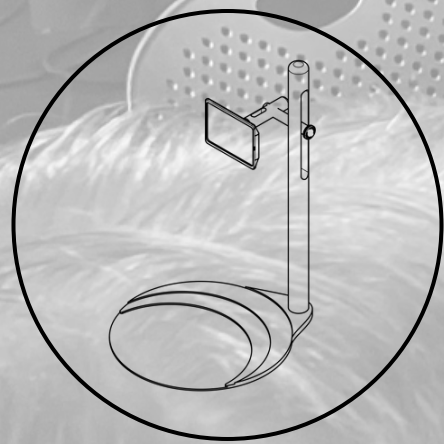
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# R E S E A R C H

Project Brief / Secondary Research / Primary Research / Design Opportunity / Design Brief

# PROJECT BRIEF

The Ohio State DESIS Lab is partnering with Dominion Middle School to establish a Digital Public Participation Lab. This lab will be a place where community members can gain access to emerging technologies such as the Hyve-3D, a collaborative virtual reality system.

For our senior capstone, me and three other students were tasked with activating this lab through design concepts that allow the lab to fulfill its various functions.

This included creating an engaging space, being adaptable to many different types of users, accessibility, sustainability, having seating & surfaces, and more.



\*Picture of the Hyve-3D inside Dominion Middle School

op-ed

CONJECTURE

focus

Students will conduct a firsthand inquiry around a problematic situation of their choice and present it in the form of an Op-Ed newspaper article. This article (around 1,500 words + images) should present the problematic, by describing the context, the issues, the stakeholders and their interrelationships. The piece should provide a thick description of a situation investigated by presenting and discussing the salient issues at stake. Students are expected to use various and appropriate field research methods (e.g., interviews, ethnography, etc.). Students are also encouraged to use visual storytelling strategies, like user journey maps, to explore the problem.

Focus | To measure the scope of the problem, students will collect in the focus section articles that present and discuss other perspectives on the general research topic. Students should focus on finding articles that carries the voices of different stakeholders.

CONJECTURE

arts

Arts | To broaden their critical perspective on their problematic, students will collect articles that present artworks of any kind (visual arts, poetry, theater, music, books) of any arts. These articles should inform about qualitative issues at stake and feed sensitive insights.

CONJECTURE

business


Business | In the form of a service type solution, students will present cases of innovative business models. While students should look into businesses that addresses issues pertaining to their problematic, they are also encouraged to think outside the box and share innovative business models that may foster new types of avenues.

CONJECTURE

science & tech

Science & Technology | As a form of precedent analysis (case study of design projects), students will collect articles presenting sciences, technologies or projects developed to address some of the issues related to their problematic. Students should focus on strategies that were developed outside the traditional field of design.

# SECONDARY RESEARCH



www.dancker.com

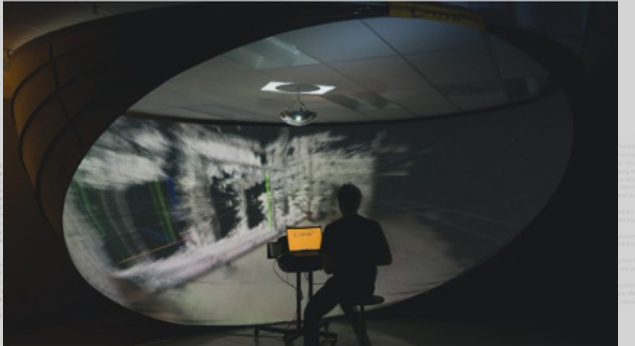
## Technology, Space and Furniture Working Together

It's not a cubicle, nor is it an office. It's an experience, a culture with a shared sense of purpose. The workplace of the future will empower and inspire.

www.smithsonianmag.com

## The Cleveland Museum of Art Wants You To Play With Its Art

The digital-savvy museum is using more than a dozen interactive games to collect data on how visitors digest artwork



www.hyve3d.com

## Hyve-3D

Hyve-3D is a multi-user VR co-design system that allows you to get immerse without headsets and 3D sketch and interact via the 3D cursor.

A study called the "Exceptional Experience" conducted by AVIXA in 2015 determined that blending technology, content and space is what contributes to the best kind of modern workplace

It's an experience, a culture with a shared sense of purpose. The Hyve-3D is an immersive design and visualization system. It allows creating three-dimensional sketches and viewing them real time in 3D. It is intended for the use of architects, designers, animators, engineers and artists.

"We find that play is very uninhibiting way to engage people to talk about art and learn about art."

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## SURVEY

A survey with 125 college students that had to do with comfortable learning environments and learning new technology

and when asked about how familiar they were with new tech such as Virtual Reality, a response that peaked my interest was one that said they are very familiar with VR but have never touched one because it gives them anxiety.



## CO-DESIGN

Mylo, Sophie, and I held a co-designing session with creatives, that included students in architecture and design

they had take home work which de-briefed them on the Hyve and got them thinking about the space

Next, they did two layers of collective visioning to gain insights on what creatives wanted out of the space

and finally, they analyzed fake renderings of spatial design of the DPP Lab



## OBSERVATIONS

Next I observed multiple co-working spaces, makers spaces, a technology lab, and libraries where I had conversations with the people there.

I then had the opportunity to participate in a demonstration of the Hyve-3D for a group from IBM.

I was able to observe people completely new to the Hyve (IBM people), A Hyve specialist, and a designer as a user. Each group gave insight into potential opportunities.

# PRIMARY RESEARCH

The co-design session went really well, it facilitated conversations that could not have happened without these activities; they talked about the need for a flexible workspace, areas for collaboration, low profile furniture in order to see into the Hyve, fluidity, flexibility and more.

Two former users of the Hyve voiced their concerns about having middle schoolers interact with such a delicate technology

One of the things she pointed out was that, this is a very touchy system, and is easily bumped, and that they were told "do not touch the projector and if you knock the podium it knocks everything off"

this gave me the opportunity to address usability issues INSIDE THE HYVE, rather than outside



## CO-DESIGN SESSION



# OBSERVATIONS



## 1 CO-WORKING SPACES

"The biggest value from my perspective, the tools are cool, but being able to sit down and talk and pick somebodys brain about random stuff that they might know about is the biggest value of the place."

Key takeaways from these observations included understanding the value of spontaneous interactions at co-working spaces and the importance of creating a fun and inviting space.

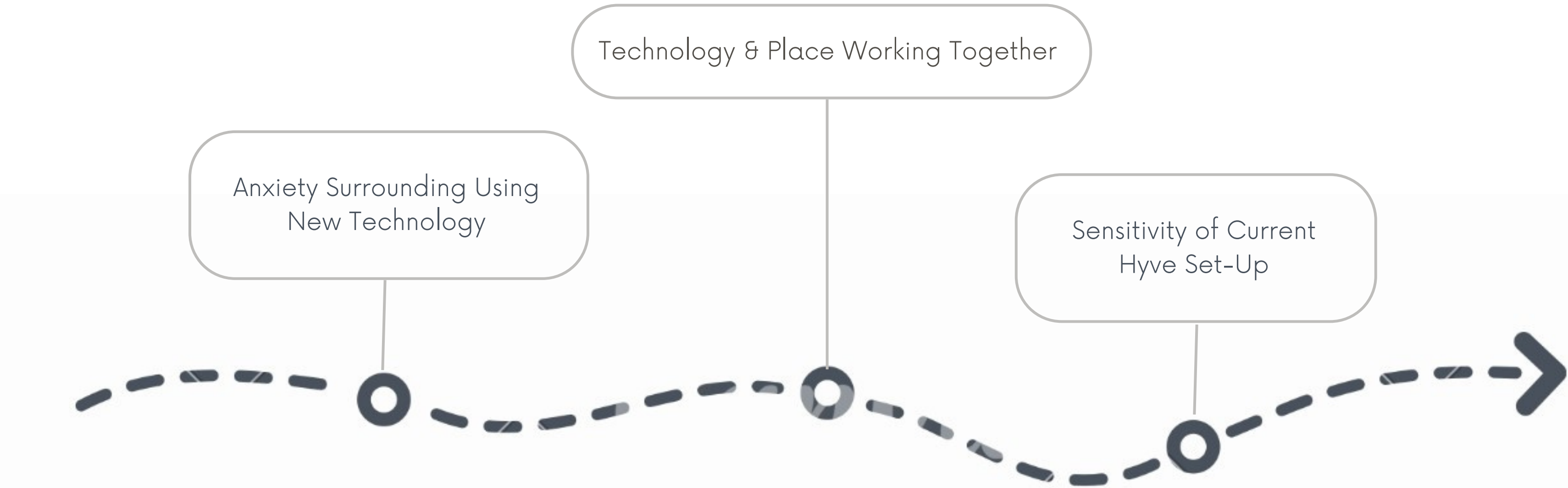


## 2 IBM DEMO

During the set up, there was constant vibration from the podium moving, and only having a trackpad made it hard to maneuver what was on the screen

During the demo, the podium and cables got in the way of people and they weren't sure where to stand and were hesitant to go inside the Hyve

At the end, there was concern with trying to maneuver, iterate, and hold the iPad all at once



# DESIGN OPPORTUNITY

What can be done to create a **seamless** experience while using the Hyve-3D and its interface (sketching, iterating, modeling) while also enhancing the space inside in order to support its immersive nature?

# DESIGN BRIEF

## OVERARCHING GOAL:

What can be done to create a seamless experience while using the Hyve-3D and its interface (sketching, iterating, modeling) while also enhancing the space inside in order to support its immersive nature?

## SPECIFIC GOALS:

### 1. Seating & Surface Concept that is Adaptable to Flexible Workflows

- a. Currently there is no furniture inside the Hyve besides the small podium that holds the projector, Macbook, and iPads. Having to hold the iPad while also using the interface is not sustainable for long periods of time, such as when sketching inside the space. There is an opportunity for a surface that allows the user to set the iPad down while still being able to pivot and move around the space.
- b. The optimal viewing experience is when the users' eyes are at the horizon level and currently, there is no way to regulate or signify this while working. A seating concept that puts the viewer at the horizon level according to their height would address this issue. This concept could be adaptable to multiple workflows, giving the user an option to either sit or stand without interfering with the ideal perspective in the Hyve.

### 1. Stabilizing Projector

- a. Right now, the projector is attached to a podium that is on wheels and when the podium is even slightly touched, it creates a vibration that causes the whole projection to shake. The projector can also be knocked out of place, which would throw the whole projection out of place. The projector needs to remain stable while in use for both functional and experiential purposes.
- b. This stabilizer could also double as storage for the Macbook & iPads while it is not being used, allowing for easy set up when used.

### 1. System for Learning New Technology

- a. Since this is the only Hyve in the US, a majority of users will be new to this interface. There is an opportunity for creating a reference guide for those in the space to be more comfortable with using an unfamiliar technology.
- b. In accordance with a guide, a source for troubleshooting issues while using the technology would be helpful.

- Addressing Opportunities for Further Immersion into the Hyve
  - Since this is an immersive technology, there's an opportunity to address small concerns that can add to the magic of this technology.. Also, The more seamless the technology becomes, the more immersive it will feel.

## STRATEGIES TO MEET YOUR OBJECTIVES:

### Seating & Surface Concept that is Adaptable to Flexible Workflows

- Way to hold iPad so that arms don't get tired/ you're able to move around still
- Furniture that assists standing and sketching / sitting and sketching / meeting the horizon line for optimal viewing experience
- Adaptable for range of different heights
- Chair that folds into a surface to work on
- Way to stabilize iPad when sketching

### Stabilizing Projector

- Could act as storage for when items are not in use
- A way to lock things inside

### System for Learning New Technology

- Physical & digital reference guide for users to reference
  - Held inside the podium?
- icon/ branding for the reference guide that is consistent with the VBL of the DPP lab and/or the Hyve

### Addressing Opportunities for Further Immersion into the Hyve

- Cord management
- A way to signify the optimal space to stand for viewing

## OUTCOMES/EXPECTATIONS/IMPACT:

A furniture concept has the opportunity to:

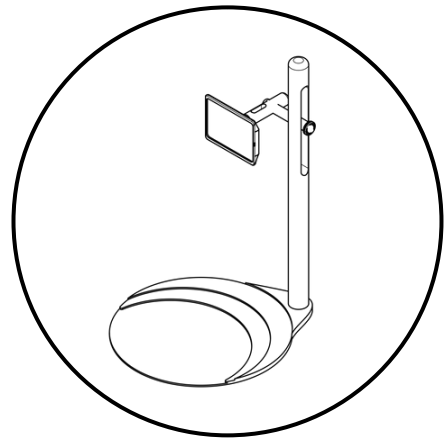
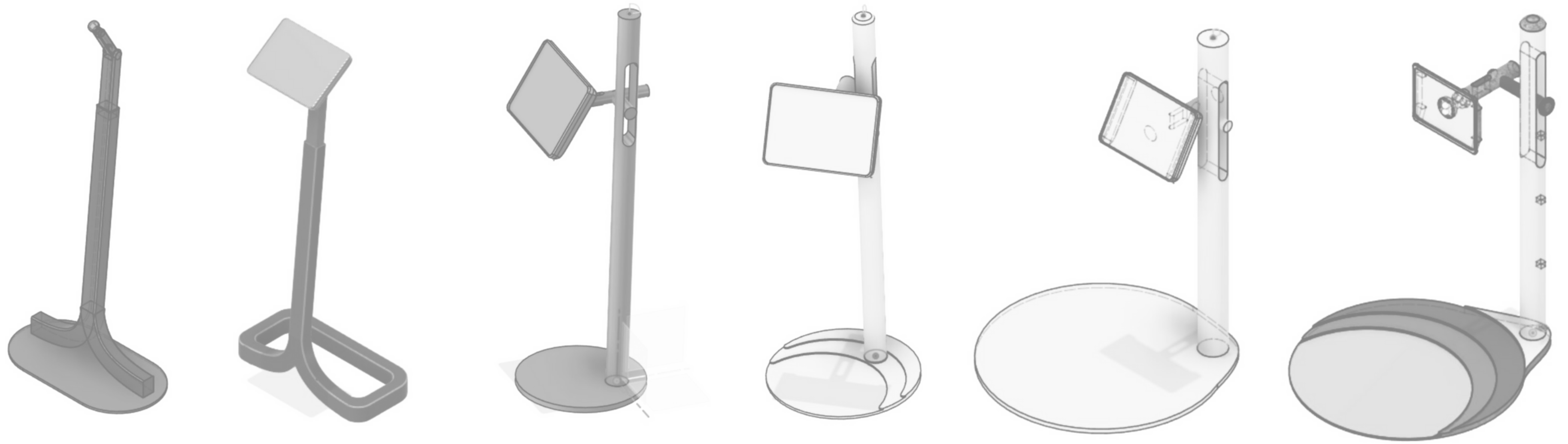
- Enhance the useability of the current Hyve interface with furniture made specifically to support the functionalities of the iPads.
- Encourage users to use the Hyve for creative projects
- Allow for technology to not interfere with the user

A system for learning & troubleshooting Hyve technology has the opportunity to:

- Alleviate apprehension around using a new form of technology

Together they have the opportunity to:

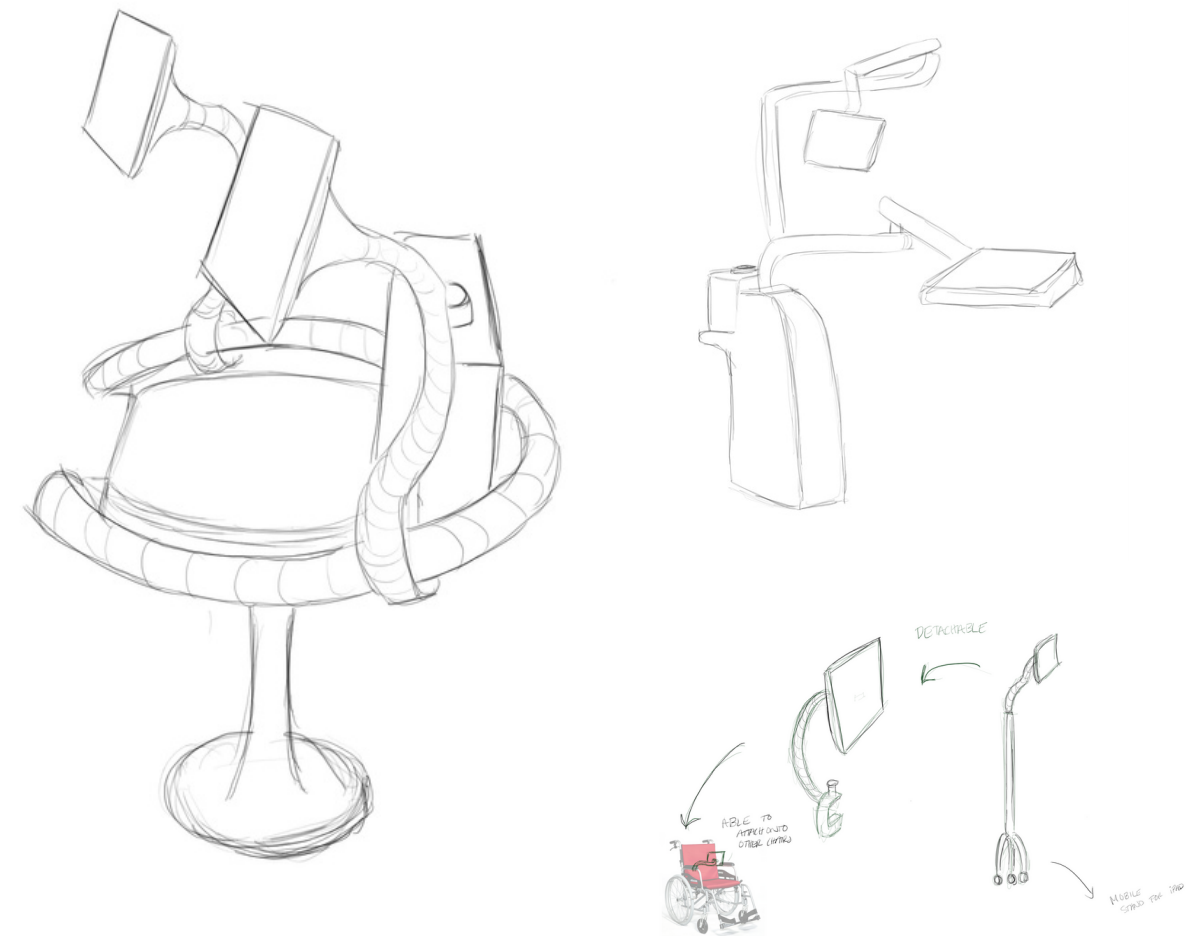
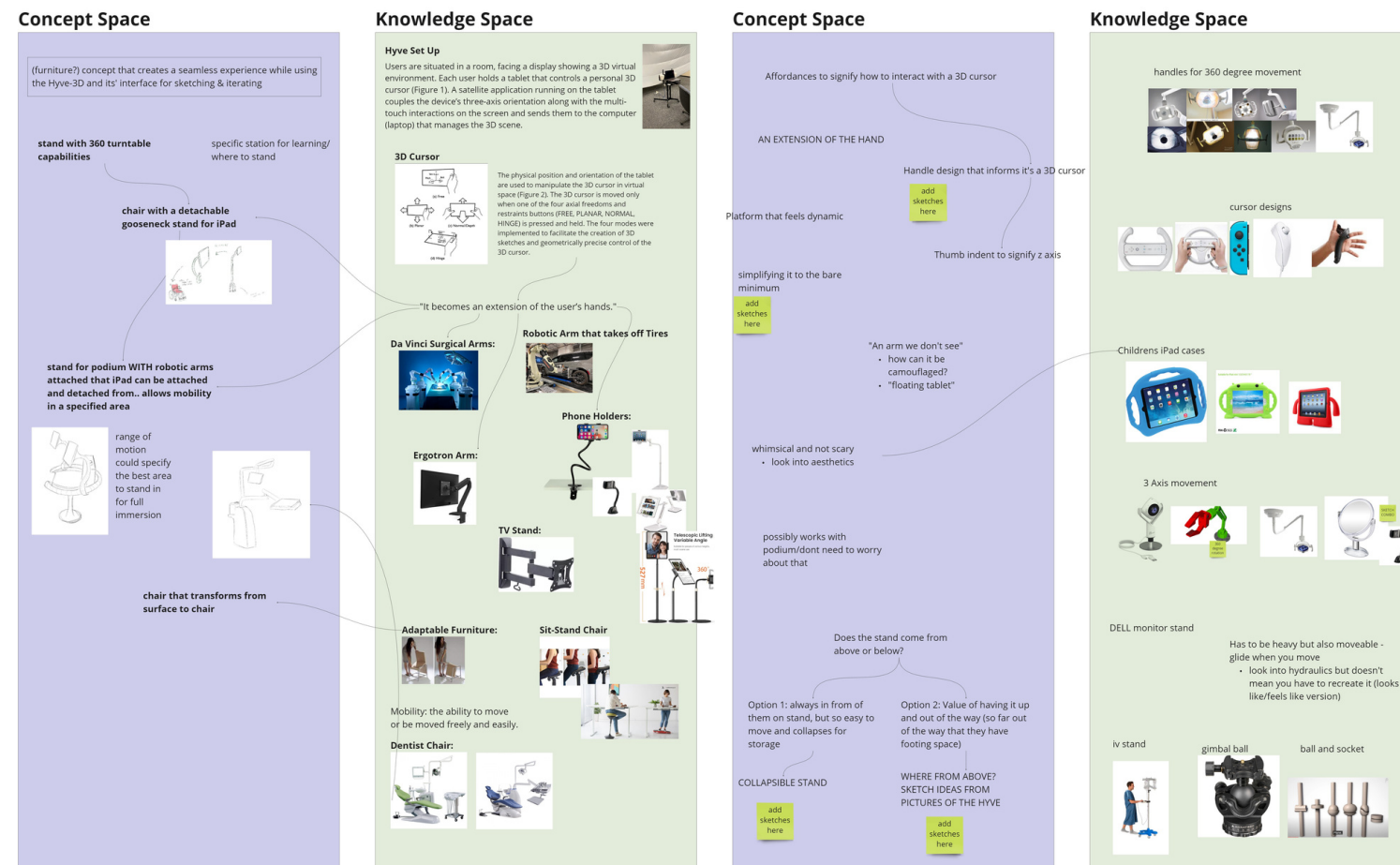
- Create a comfortable workflow for a range of potential users
- Inherently add to the immersion of the space by creating a seamless workflow



# DEVELOPMENT

Concept Ideation / Evaluative Research / Form Development / Aesthetic Language  
Development / Prototyping

# CONCEPT IDEATION

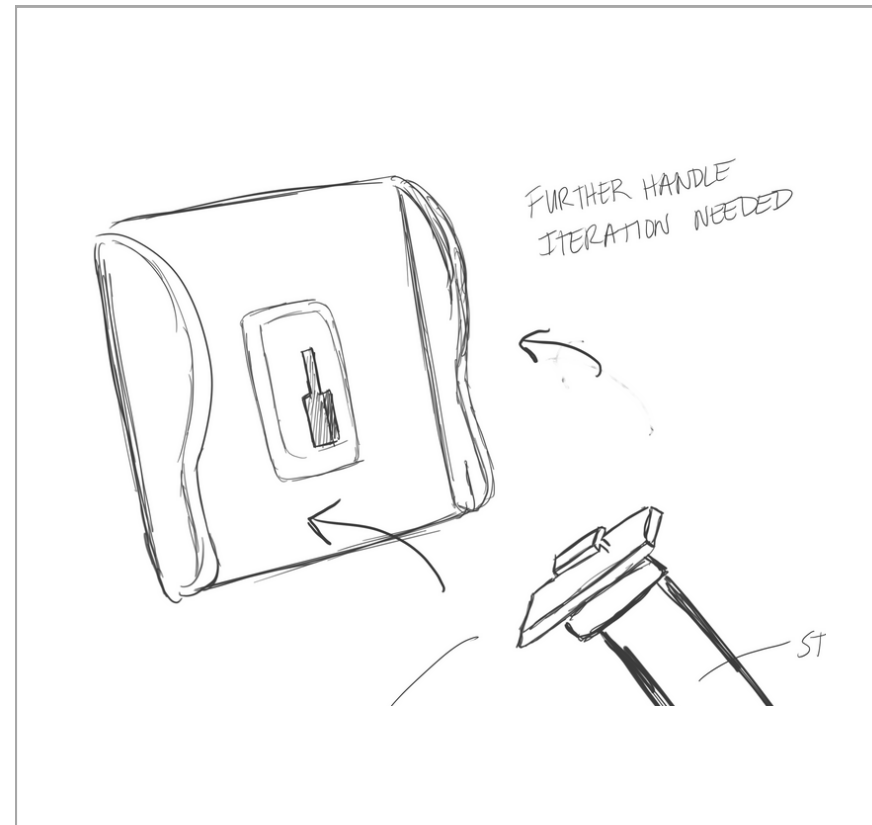


I started with **C-K mapping** to organize my concepts with the knowledge I had from the project brief. Here I used the insights from the research phase aligned with existing technology that was similar to the concept space such as existing iPad stands, robotic arms, children's iPads cases, dentist lights, and more.

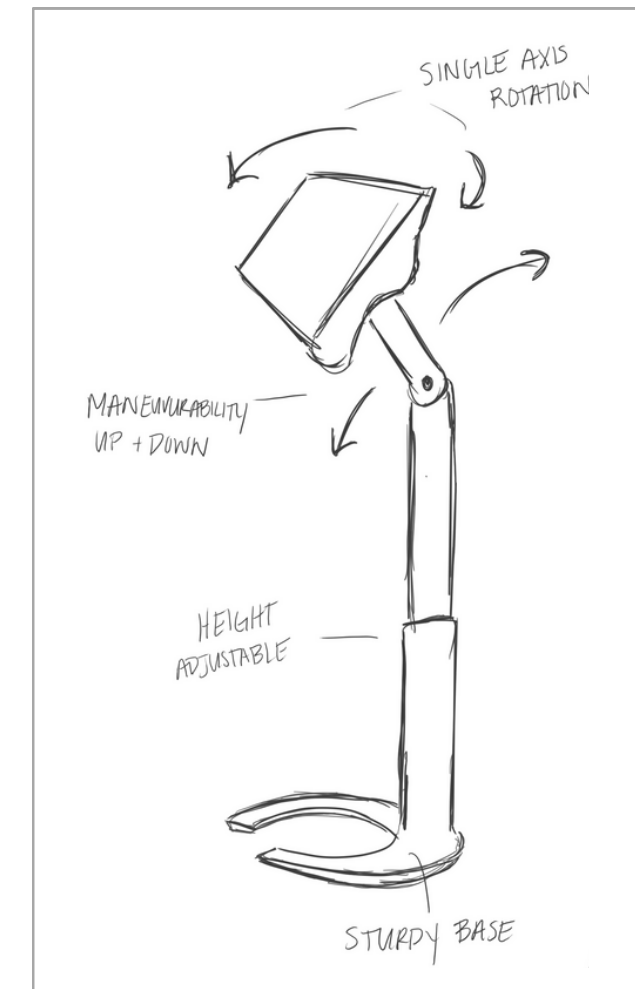
The initial sketches lacked direction because they did address the specific needs of the Hyve. The next step was developing design criteria to abide by. The criteria I landed on was **Free Rotation, Flexible yet Sturdy, Inform the User, Adaptable from Sketching to Navigating, Standing and Sitting, and Not Impede on Immersion**

# EVALUATIVE RESEARCH

In order to understand how the design criteria would be translated into the design, evaluative research was conducted to gain user input on certain elements of the design. The two elements I decided to focus on were figuring out the degrees of rotation, and informing the user through use of affordances



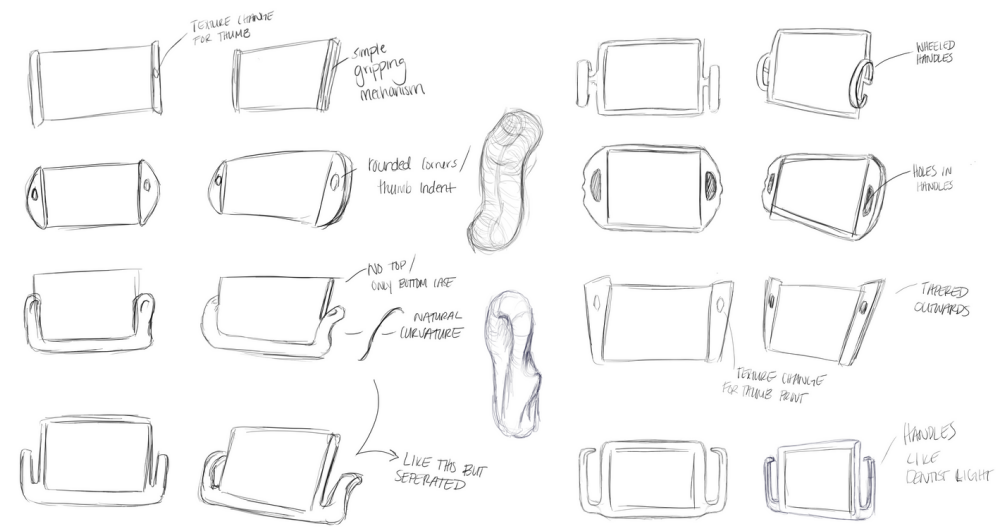
**1 INFORMING THE USER**  
What affordances tell the user how to use the iPad as a cursor? What factors can signify to the user to all three axis of rotation?



**2 DEGREES OF ROTATION**  
What behaviors occur while working with the iPads? How can we gain more knowledge of the workflow of the user?

# 1 INFORMING THE USER

What affordances tell the user how to use the iPad as a cursor? What factors can signify to the user to all three axis of rotation?



To answer the first question, I did iterations on different handle designs to investigate different forms



Next I made 4 prototypes for user testing. Each foam handle could slide onto a foam core "ipad" in order for people to test it out.



## ACTIONABLE INSIGHT

I learned a lot from this investigation. For example, one handle was good for maneuvering the iPad in 3D space, but limited access to the screen to interact with the interface.

Another big takeaway was the there is a need to better understand what gestures are most commonly used to better design a handle that would function properly with the Hyve interface.

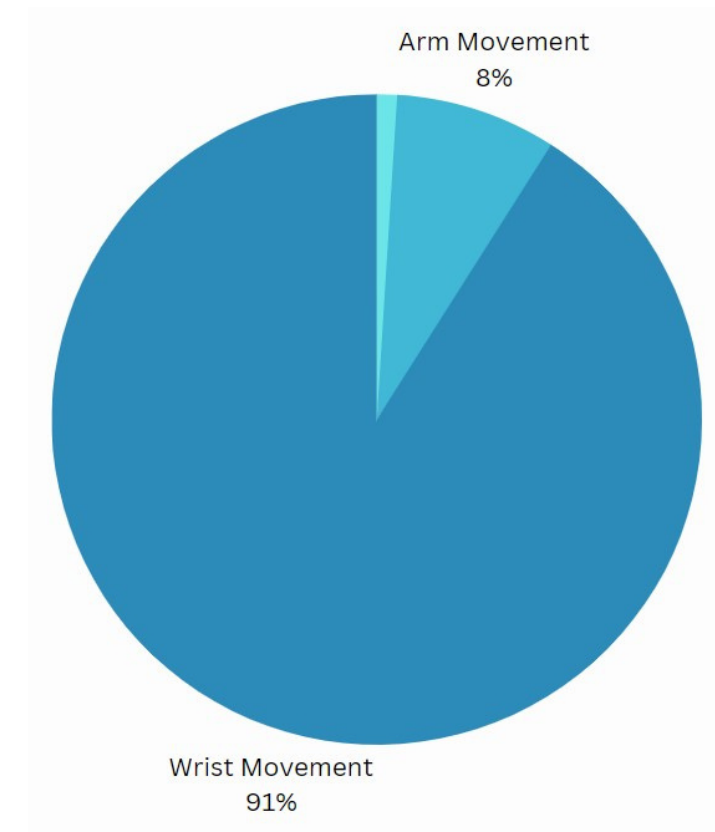
In conclusion, I learned that the iPad case needed to support holding the iPad, couldn't impede on access to the screen, and should inform the user through its' form.

## 2 DEGREES OF ROTATION

What behaviors occur while working with the iPads? How can we gain more knowledge of the workflow of the user?



For the second test, I used my body to facilitate the movement of the iPad to understand workflow. Since Sophie was familiar with the interface and workflow, they helped me preform this test.



*Leg Movement = Moving around inside Hyve (floorspace)*

*Arm Movement = Moving around in close proximity to yourself*

*Wrist Movement = Rotational Movement*

## ACTIONABLE INSIGHT

So much was learned through this exercise. There are two different "modes" when using the iPads: cursor mode (when the iPad is being moved freely in space) and sketching mode (when used for sketching). Each had different needs; when in cursor mode, all rotational angles are needed and any disruption to this would make it harder to use the interface. Following this insight, if the iPad case is not permanently attached to the main arm, there is no need for the stand to be on wheels.

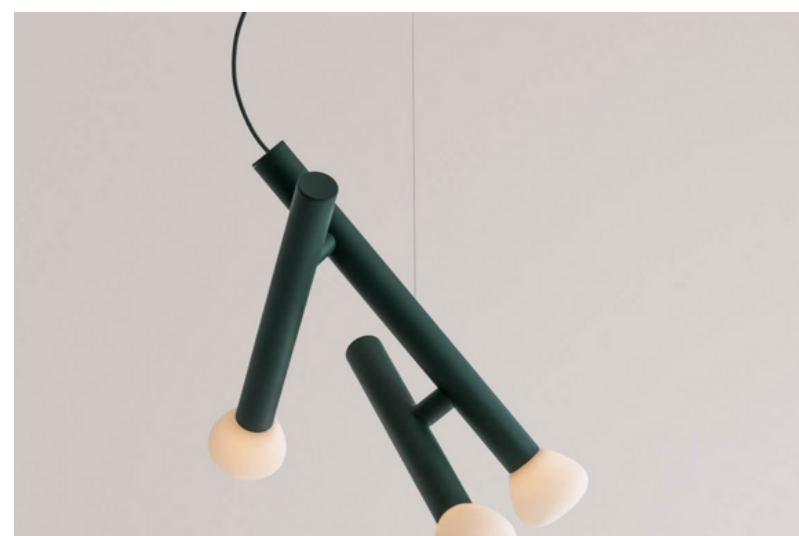
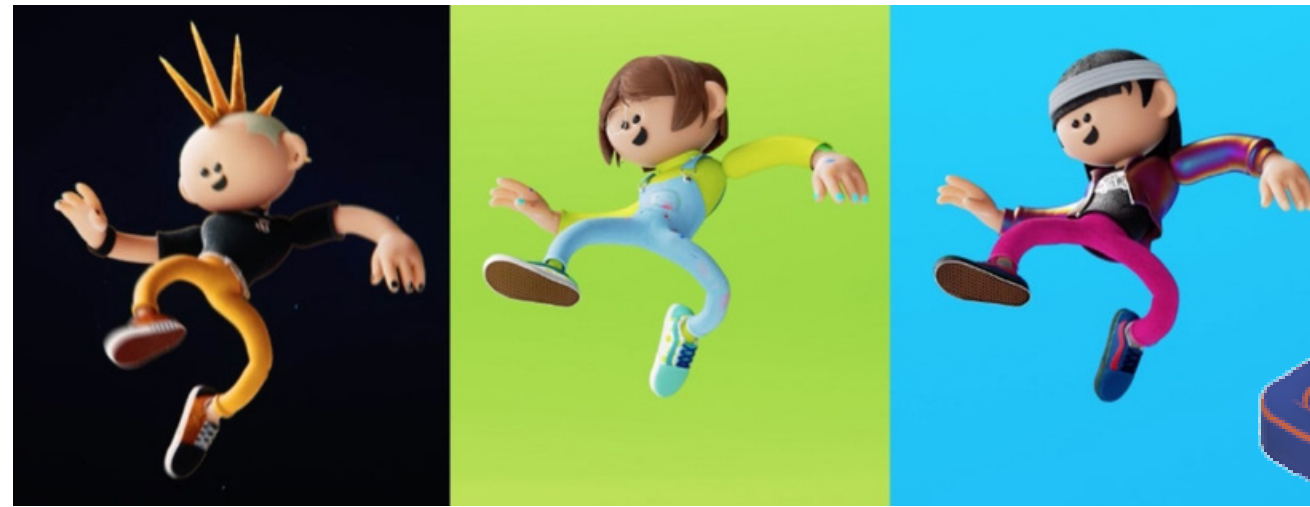
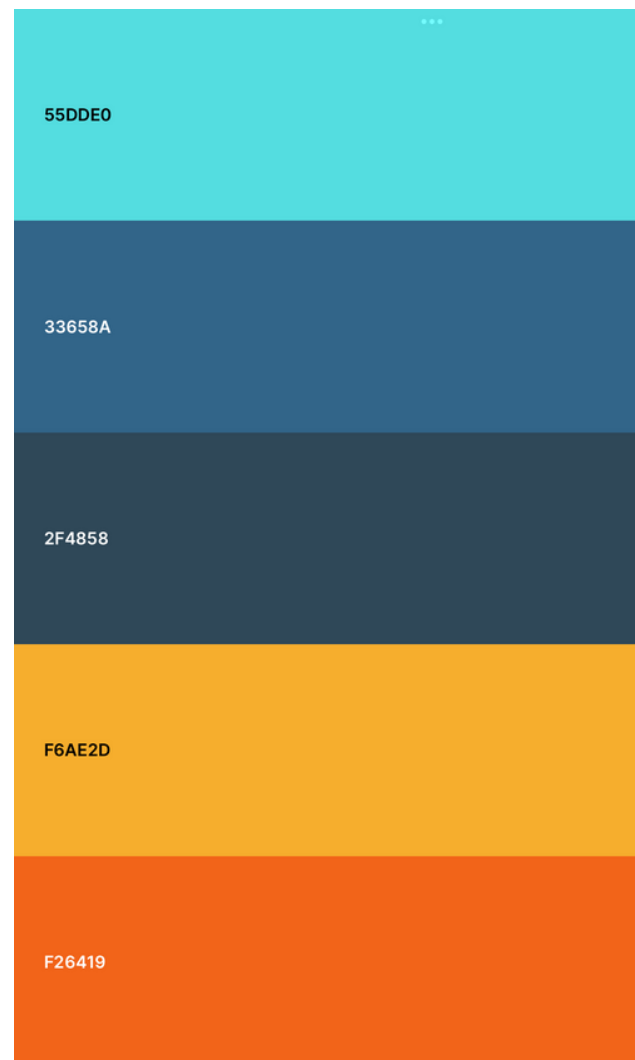
As for sketching mode, stability is absolutely essential, another reason to take out any use of wheels. No flimsy arms should be used, as there needs to be a stable base as well as solid arms to facilitate the sketching interface.

All in all, it allowed me to understand what exact degrees of movement were essential for this stand.

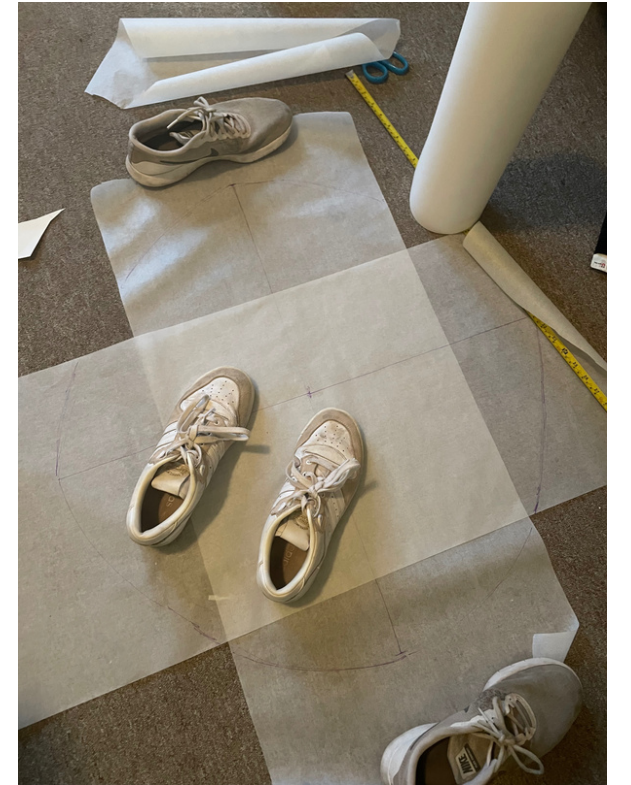




# AESTHETIC LANGUAGE DEVELOPMENT

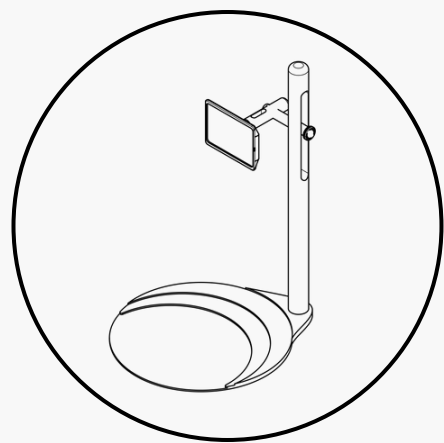


After meeting with the client, I decided to shift my focus. Stuck on the technical side, the form had to do with function and I lost the touchpoints and lost the overall story of the stand. Because of this, I took a look back at my aesthetic direction and asked myself what story I would like this stand to tell and how the form could both inform the user and invite them to use the stand.



# PROTOTYPING

To get out of my head, and understand more of the scale, I did really quick prototyping exercises.



# FINAL DESIGN

Final Design / User Scenario / Features / Back End Design



**surge**  
connect



A Tablet Accessory for  
Hyve-3D Engagement



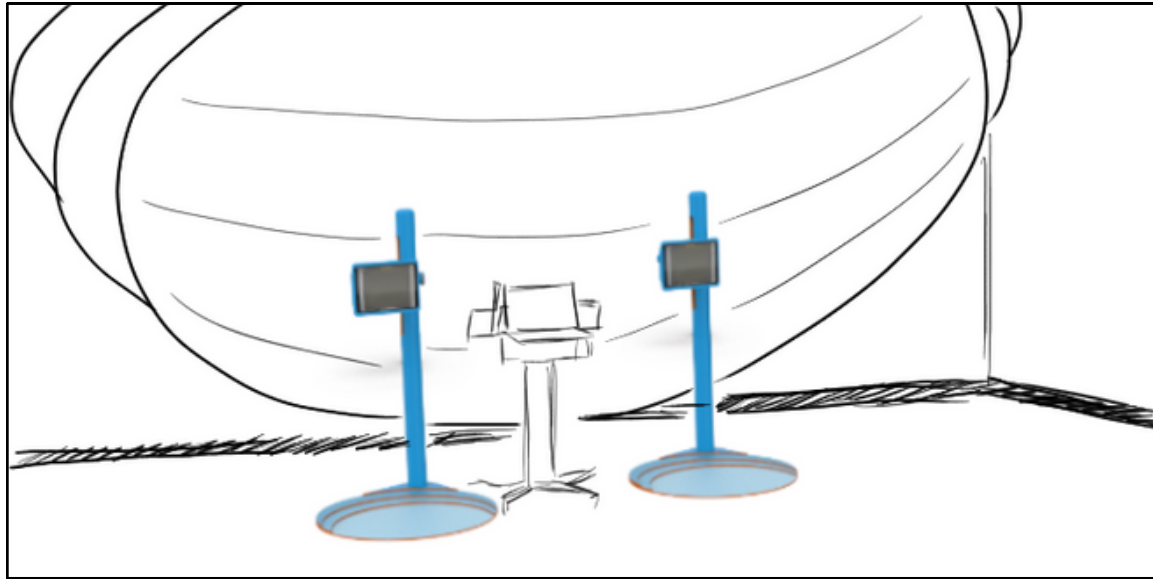
## FINAL DESIGN

The stand utilizes existing technology in order to be adjustable to a vast majority of users while the tubing provides stability and control while sketching. The case signifies to users how to hold the iPad to use its' interface as well as provides a grip while navigating the planes in 3D space. Lastly, the base invites users into the Hyve and shows the optimal space to stand for full immersion.

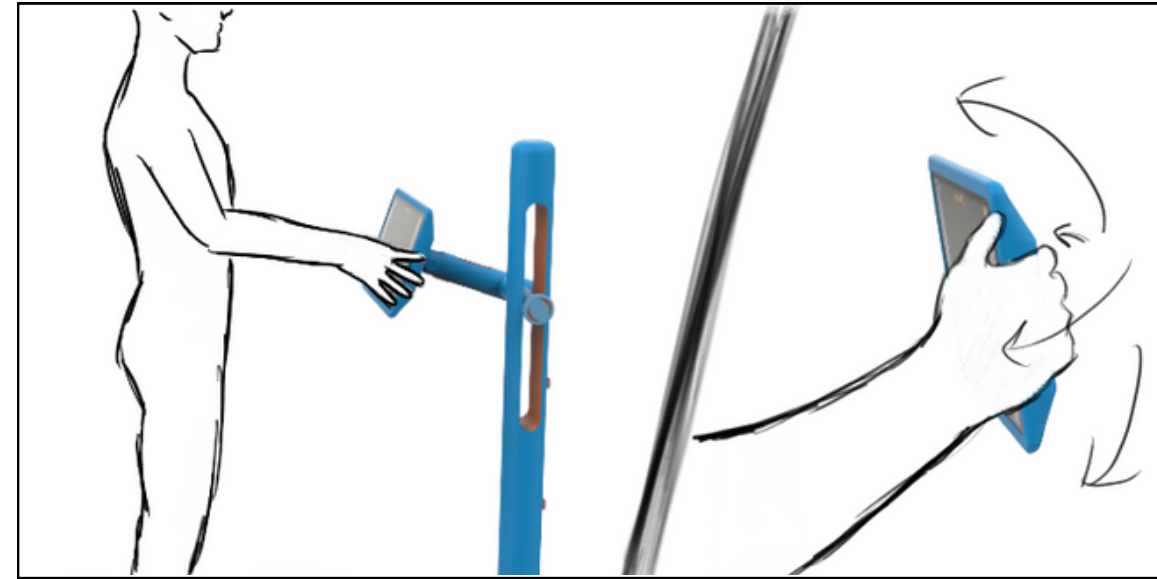
The final design utilizes the colors of both the Hyve and the DPP Lab to create a fun yet simple design that compliments the lab.



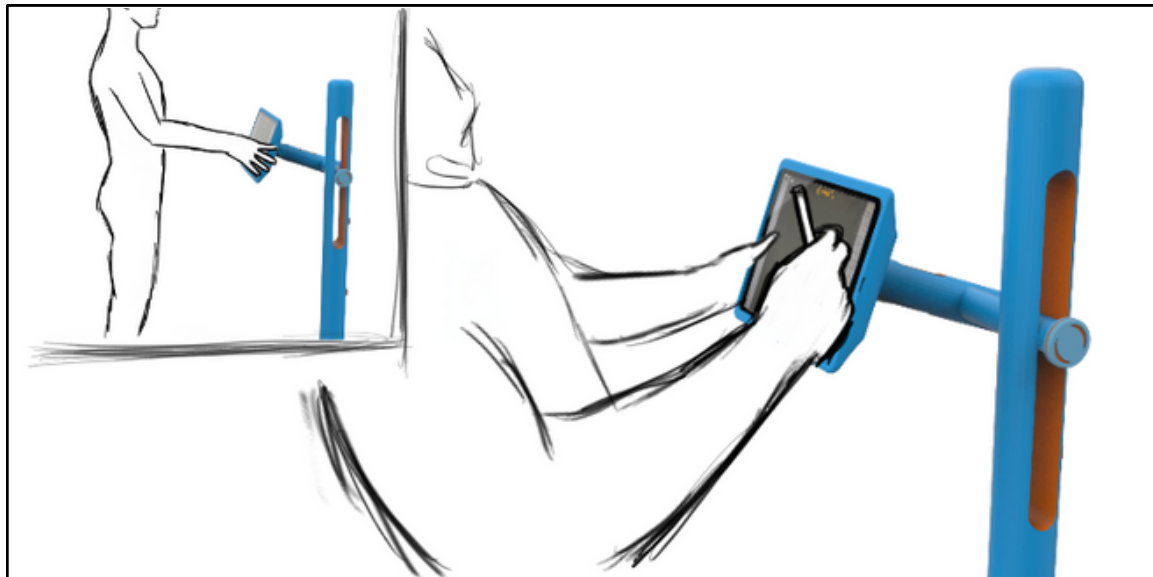
# USER SCENARIO



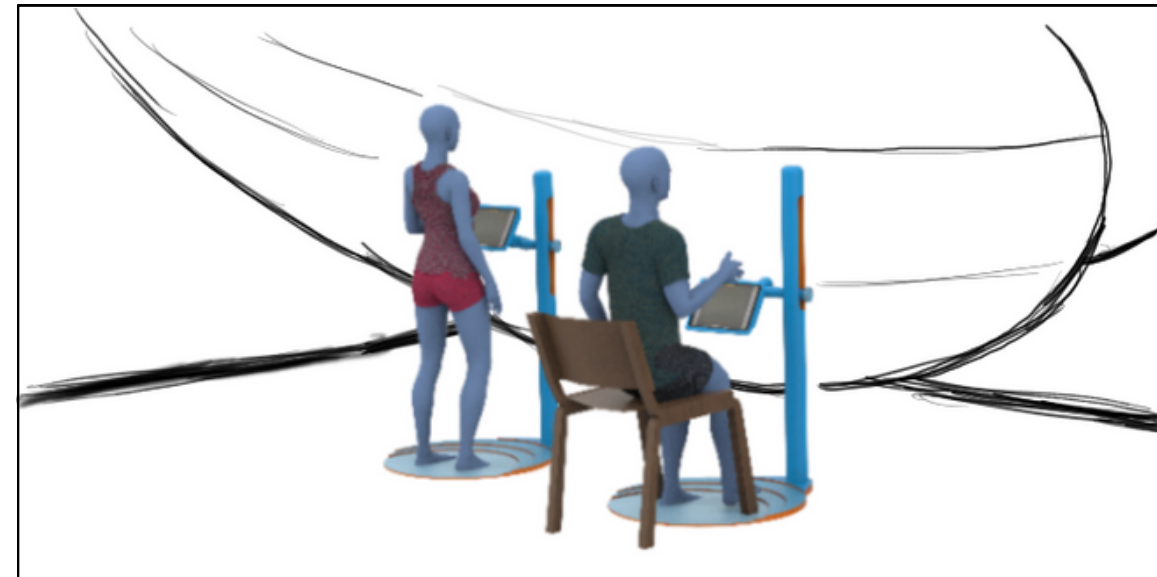
1. User steps into Hyve with stands placed in the optimal viewing space



2. User detaches iPad in order to use it in "cursor mode," and aligns the plane where its needed



3. After positioning the plane, the user snaps the iPad back into place in order to start sketching



4. User is able to sketch comfortably whether sitting or standing

# FEATURES

RUBBER CASE



COLORS PALLETTE THAT REFLECTS THE DPP LAB & THE HYVE

VISUAL HEIRARCHY TO INVITE USERS IN

POWDER COATED STAINLESS STEEL ARMS

CLIPS FOR CORD MANAGEMENT

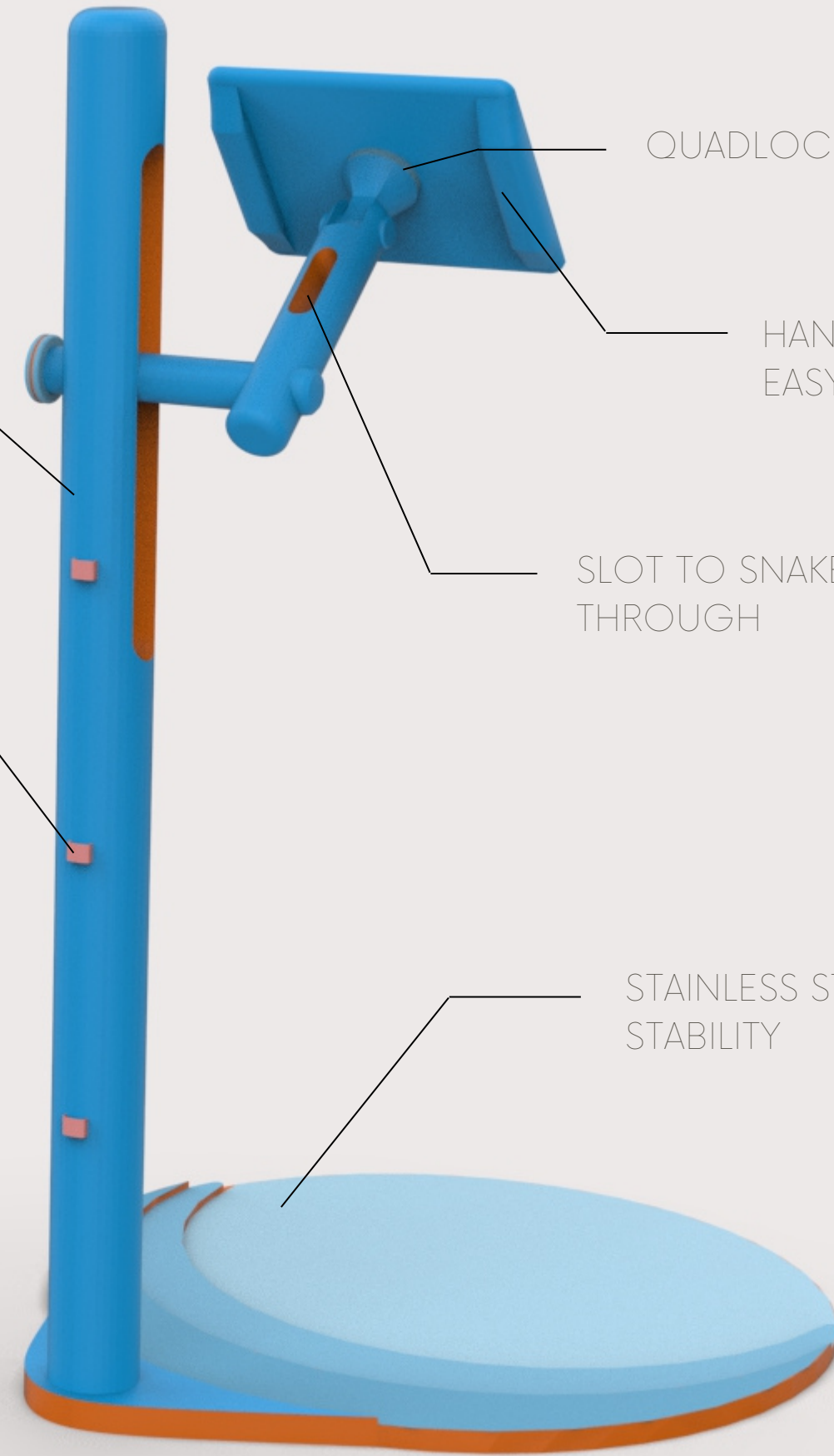
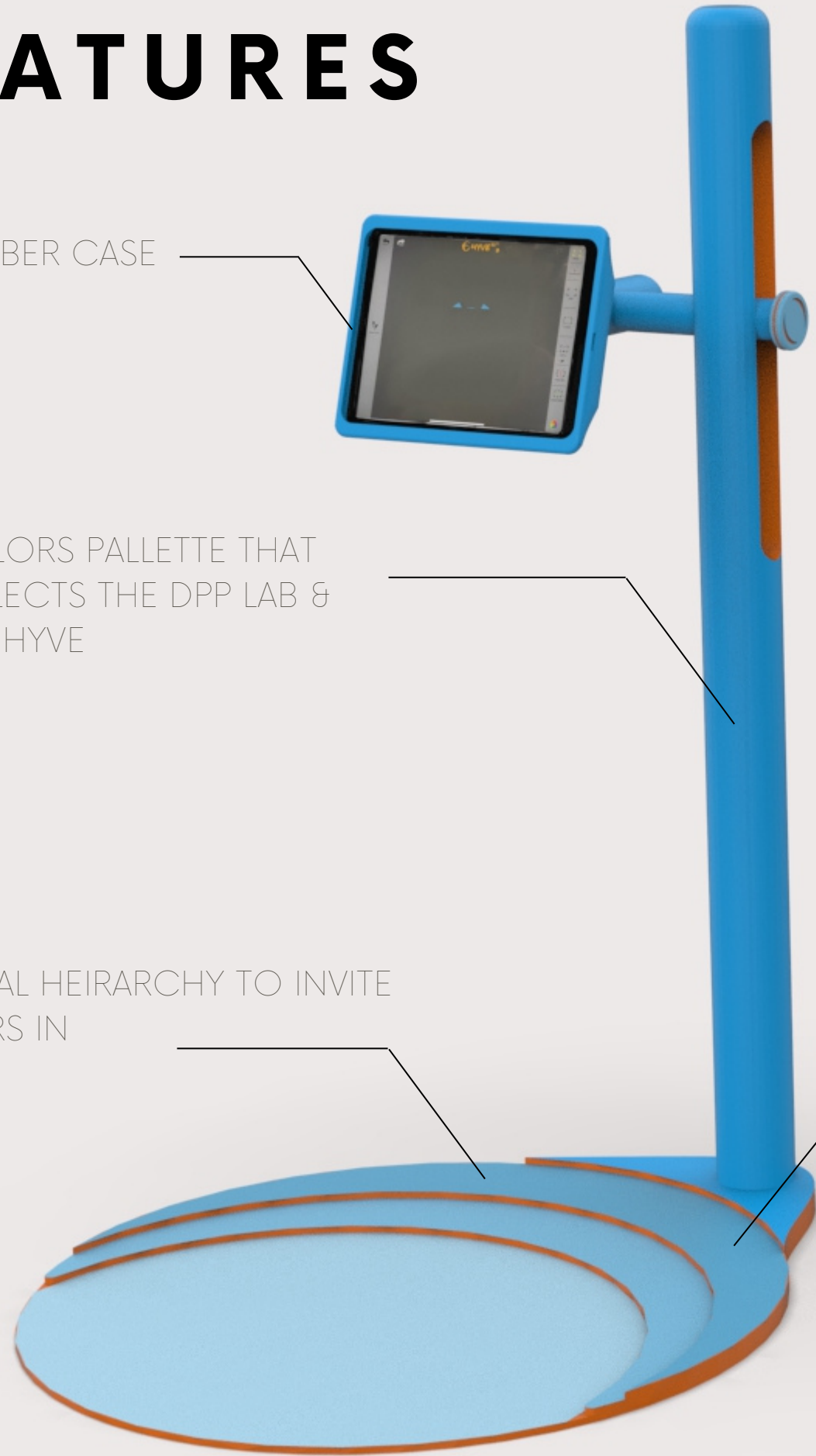
SCALLOPED DESIGN THAT EMULATES THE HYVE

QUADLOCK TECHNOLOGY

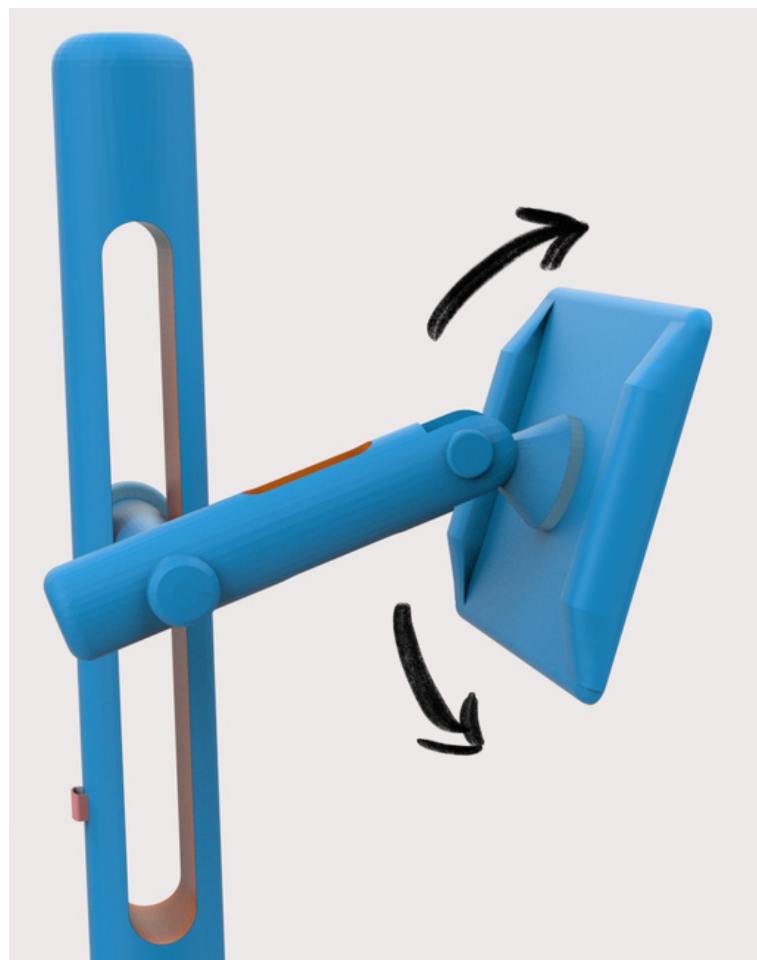
HANDLES INDENTED IN FOR EASY GRASP

SLOT TO SNAKE CORD THROUGH

STAINLESS STEEL BASE FOR STABILITY



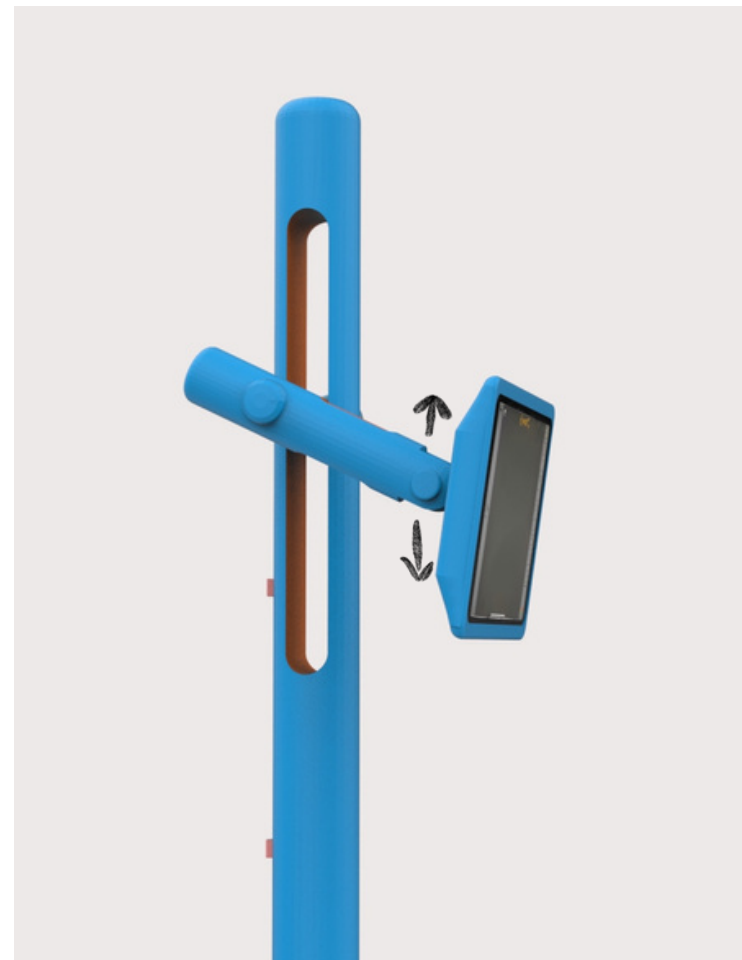




TILT



HEIGHT ADJUSTMENT



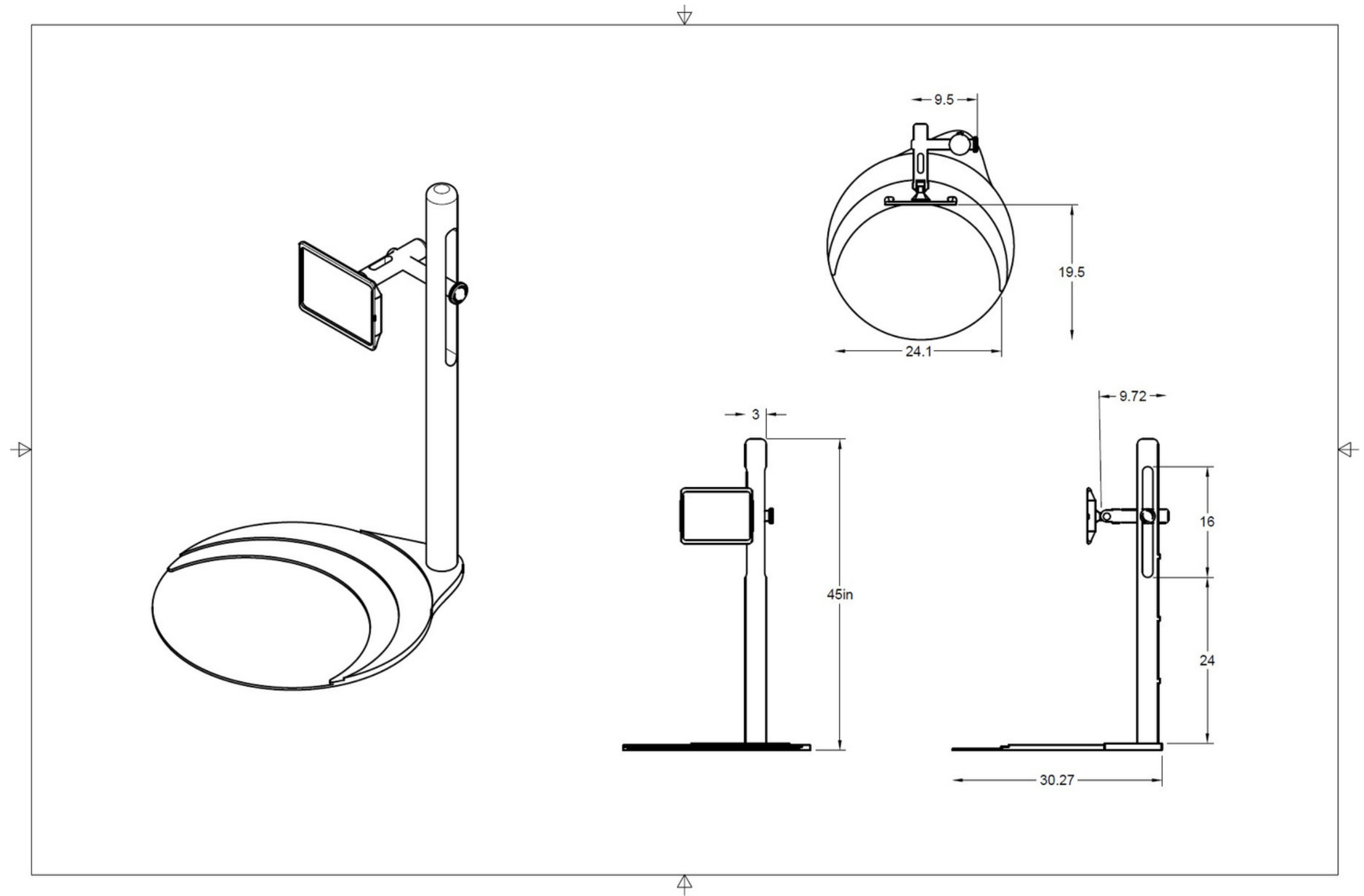
SECONDARY HEIGHT  
ADJUSTMENT



ROTATION

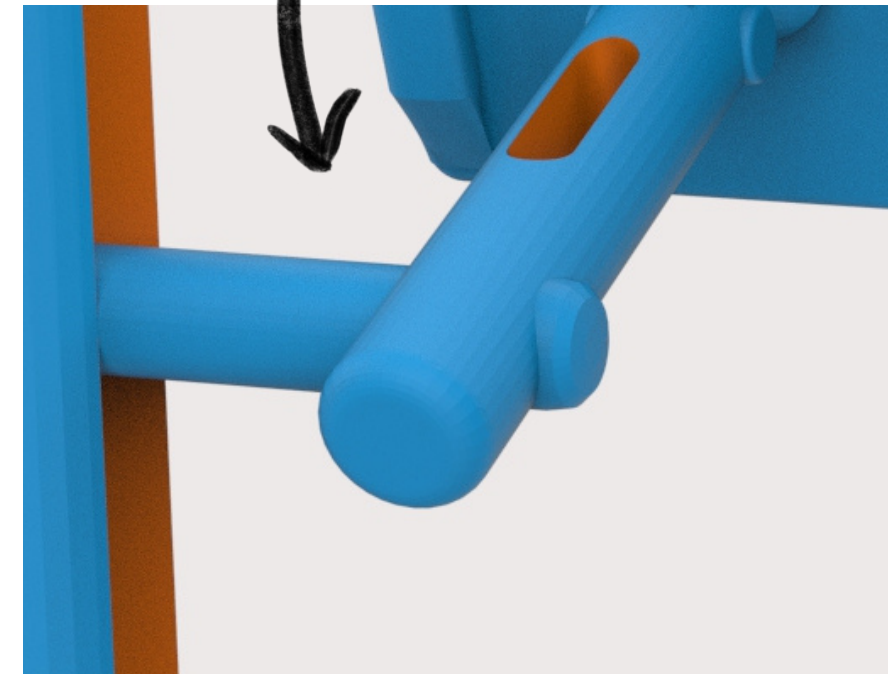
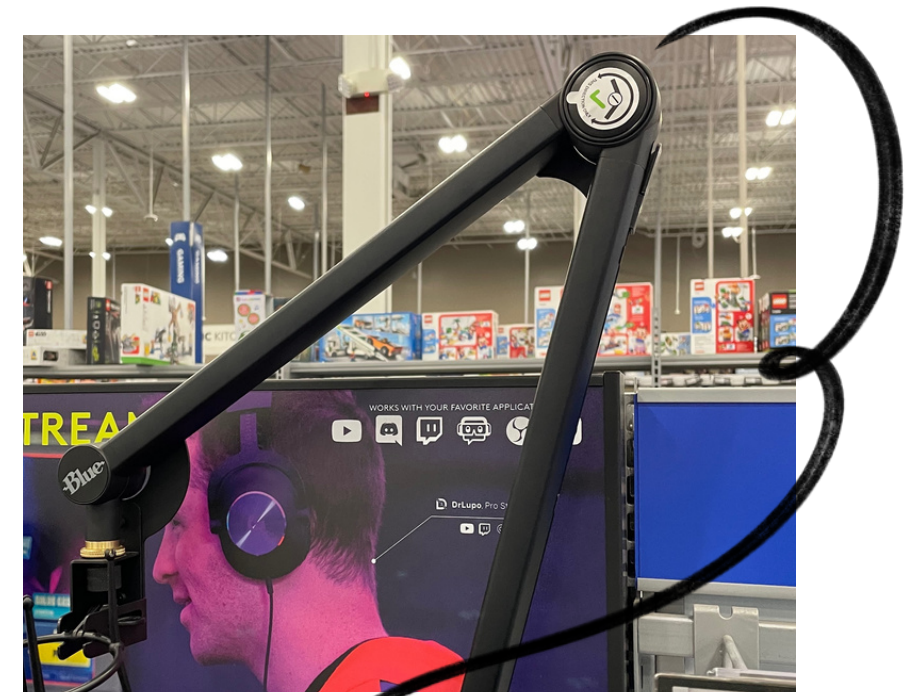
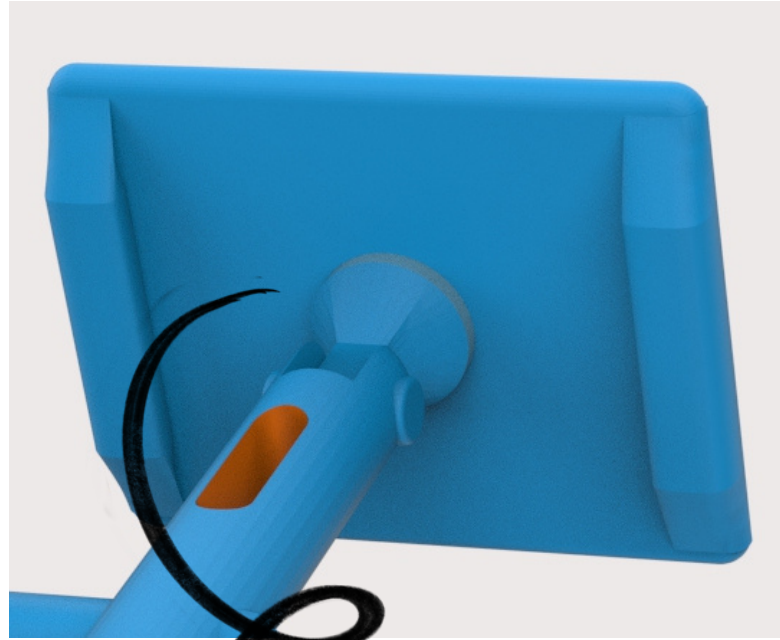
## DEGREES OF ROTATION FEATURES

# BACK END DESIGN



## ORTHOGRAPHICS

Measurements according to *The Measure of Man and Woman* by Henry Dreyfuss



**REFERENCES TO  
EXISTING TECHNOLOGY**

surge  
connect

A Tablet Accessory for  
Hyve-3D Engagement



**T H E E N D**