

PORTAL AR

Versatile, compact handheld exhibition presentation with augmented reality.

CHALLENGE

Existing museum or public entertainment venues planning to offer visitors augmented reality experiences need an affordable, sustainable and scalable solution serving a diverse audience.

DEMOGRAPHICS

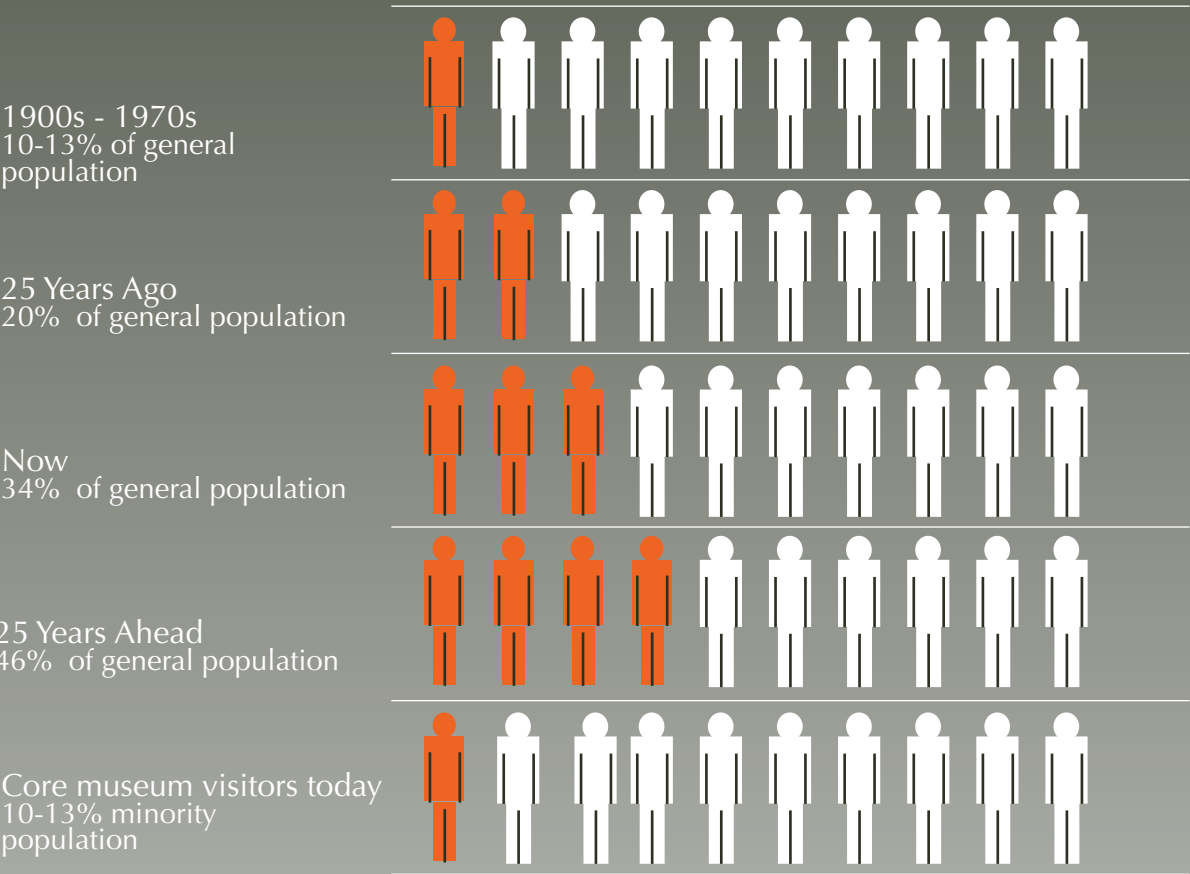
US POPULATION
333 Million

MUSEUM ANNUAL VISITS
78 Million

PERCENTAGE OF AMERICANS WHO VISITED AN MUSEUM OR GALLERY IN PREVIOUS 12 MONTHS



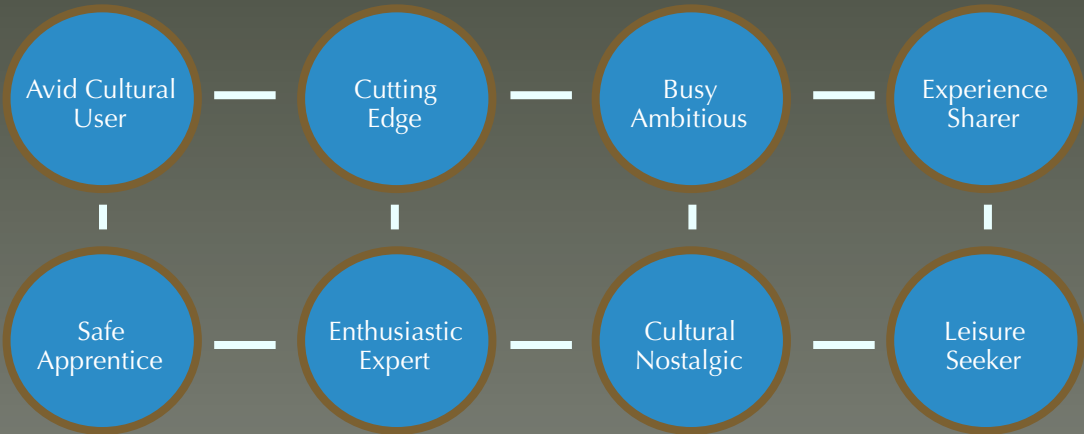
MINORITIES ARE STILL GROSSLY UNREPRESENTED IN MUSEUM ATTENDANCE



PSYCHO-GRAPHICS



EIGHT MAIN CATEGORIES OF VISITOR



STAKEHOLDER

US Museum Visitors

Activity

Visit museums, interact with exhibitions

Population

78 million

% of total Pop.

24%

Year

2021



US MUSEUMS

35,000

Five Types of Museums:

General, Natural History and Natural Science, Science and Technology, History, and Art

STAKEHOLDER

Design/Exhibit Purchasers

Activity

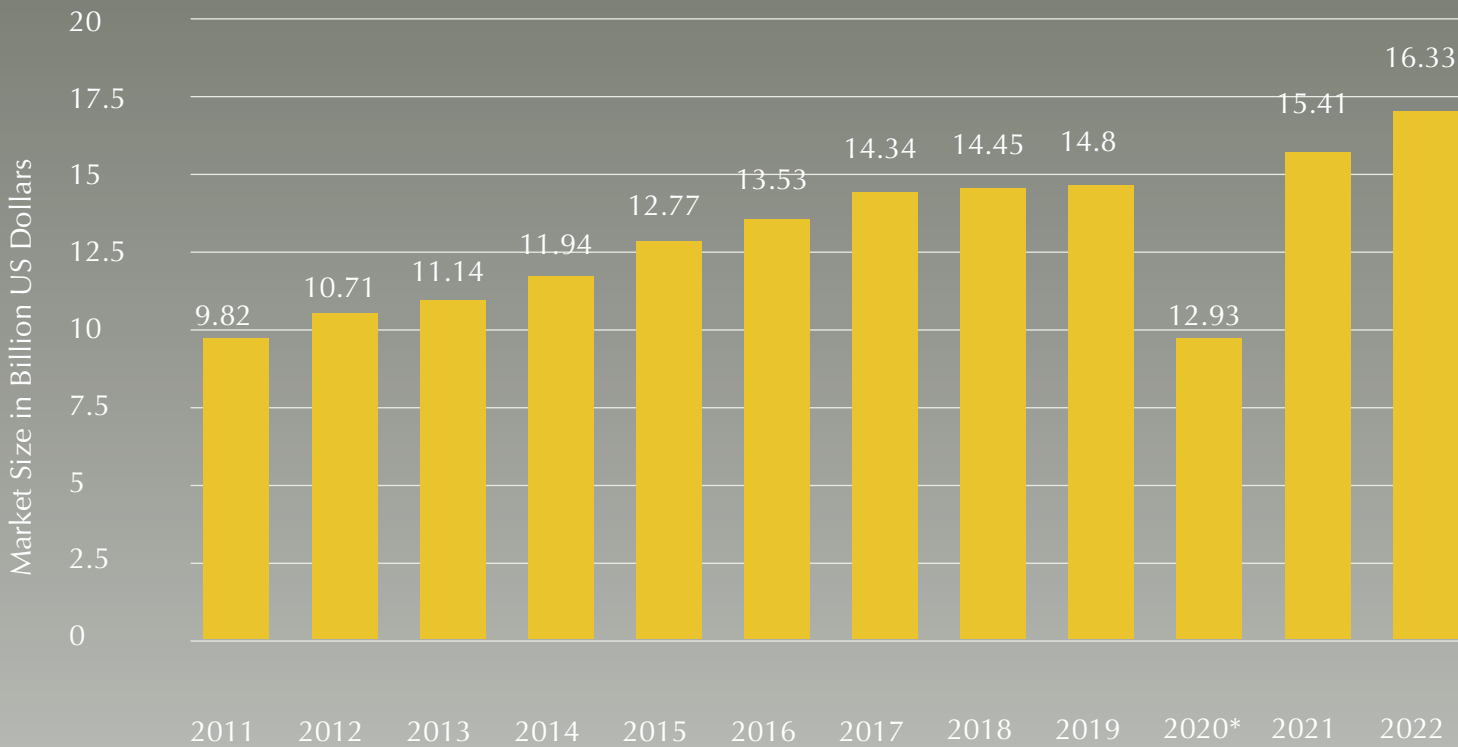
Purchases raw materials and finished goods for Museum exhibitions

Population

35,000 Orgs

Annual Spend Immersive Entertainment Market:

Market size of the museum industry in the United States from 2011 to 2021, with a **forecast for 2022**



* Covid Impact

PERSONAS

MUSEUM VISITOR

Traits

Age - Children to older adults. They show an interest in an area of study, item, time period, or an idea or want to enhance an educational curriculum.

Goals

They want to experience in real life what a screen cannot provide, collectively experience the museum as a space, and to deepen and broaden their knowledge.

Barriers

Experiential barriers exist for visitors who may be disabled (visual, physically, etc.). Language barriers, physical access or getting to the institution, personal access which includes personal feelings toward museums and personal circumstances preventing visitation, cost which includes concerns over value of visiting, time and timing which includes lack of free time and inconvenient operating hours, product which includes judgments about the atmosphere, staff, or the feel of a place, personal interest and peer group for statements about lack of personal interest and pressure from peers who do not want to see a particular place or thing, socialization and understanding for statements about belonging and understanding, and information for lack of awareness or access due to language.



MUSEUM EXHIBIT DESIGNER/PURCHASER

Traits

Average age is 41 years old, 39% female, 53% male. The role of an exhibition designer revolves around designing exhibitions for museums, private businesses, libraries, trade conferences, galleries, and commercial public events.

Goals

The main responsibility of this job is to create striking displays based on the budgetary, practical, and visual requirements set by the client.

Barriers

Designing, building and/or contracting for exhibit design's which meet museum's success criteria while hitting a budget. Re-purposing existing materials and exhibit assets for new uses. Meeting ADA and visitor requirements in design and experience. Creating exhibition spaces with the lowest amount of maintenance required while being durable. Designs sometimes need to fit a transportation requirement for traveling exhibitions.



VISION

Design an effective, unique, innovative, safe, sustainable, augmented reality/multi-sensory device manufacturable in either small batch or mass production levels. The solution should accommodate diverse spaces, exhibition/entertainment and diversity needs. It should be multi-functional scalable, easy to service and upgradeable.

RESEARCH SKETCHES



DESIGN CRITERIA/LEARNINGS

FORM FACTOR

- Portable
- Versatile and Scalable Functionality
- Multi-Function Features

DURABILITY AND ADAPTABILITY

- Sustainable Materials and Design
- 'Right to Repair' strategy
- Modular design
- Mass production as well as local/JIT fabrication

EXPERIENCE

- Designed for Museum/Entertainment Exhibitions and Venues
-

INSPIRATION
CULTURE/LIFESTYLE/FASHION



EXPERIENCE



NATURAL HISTORY



LEISURE

FAMILY



TECHNOLOGY



LEARNING



MULTICULTURAL

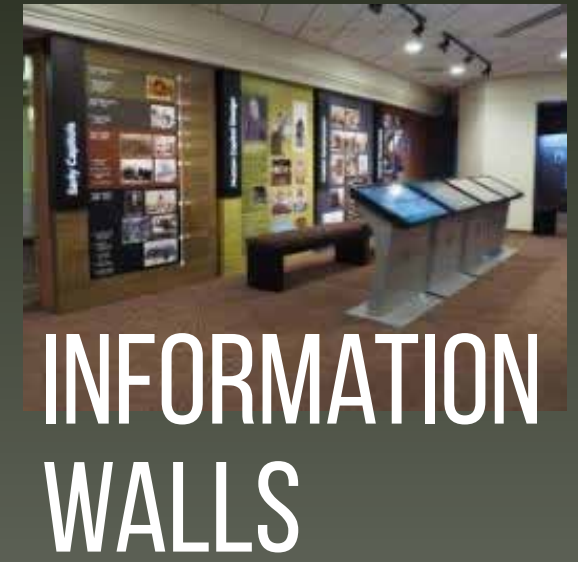
INSPIRATION
CONTEXT/SPACE



WELCOMING



LARGE FLOOR SPACES



INFORMATION
WALLS



WALL DISPLAYS



EXHIBITION IN-THE-ROUND

INSPIRATION
MATERIALS



CAST METAL

EXTRUSION



LAMINATES



VINYL SIGNAGE



GLASS/ACRYLIC

CONSTRUCTION



3D PRINTING



THERMO-FORMING



INSPIRATION
TECHNOLOGY



SCENT



PROJECTION



SOUND SYSTEMS



3D



LED/LCD

HAPTIC



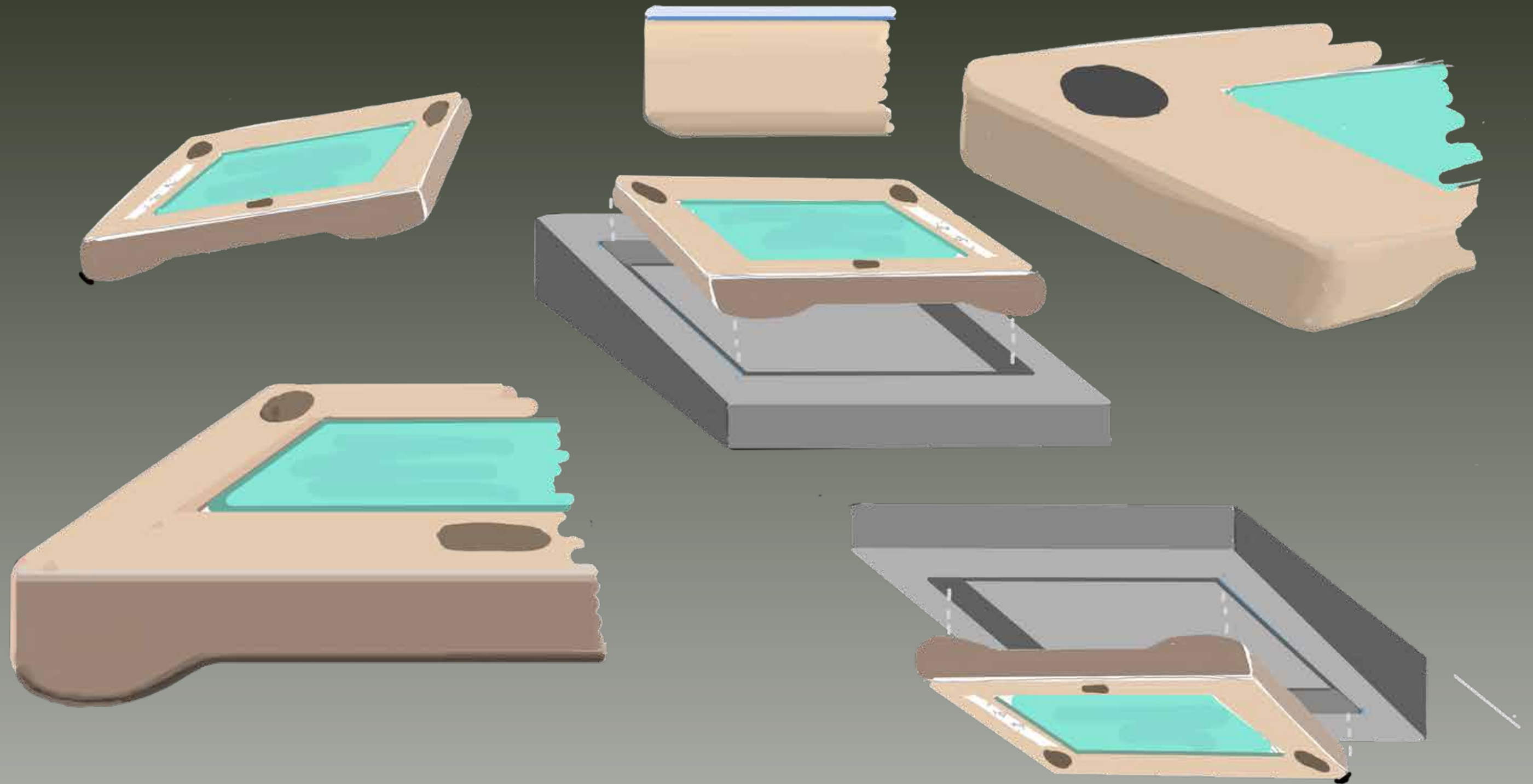
LIGHTING



DESIGN SKETCHES



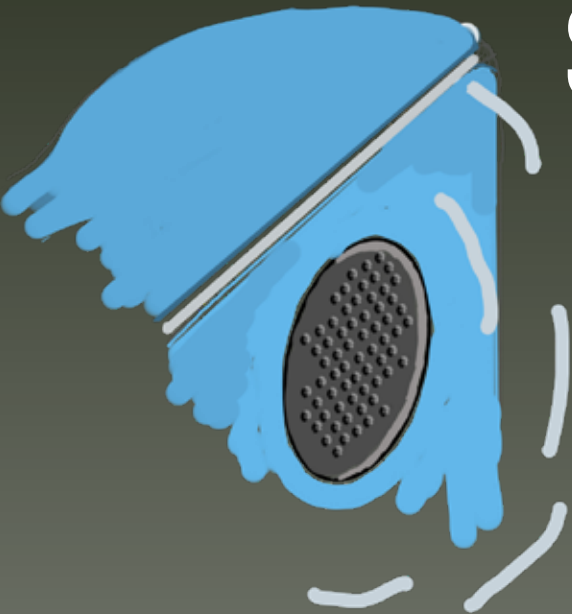
SKETCHES - PROTOTYPE



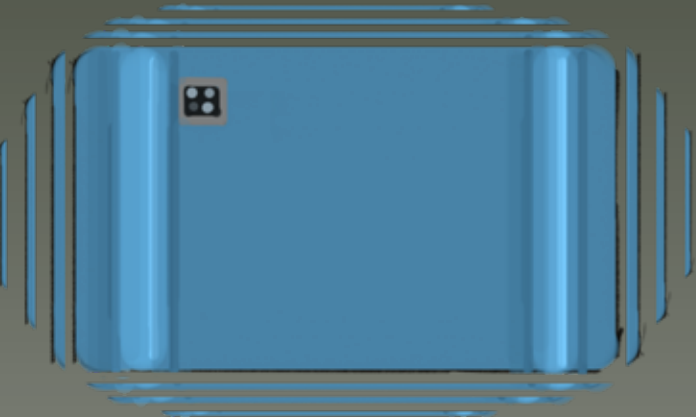
SKETCHES - PROTOTYPE - ENHANCED AUGMENTED REALITY



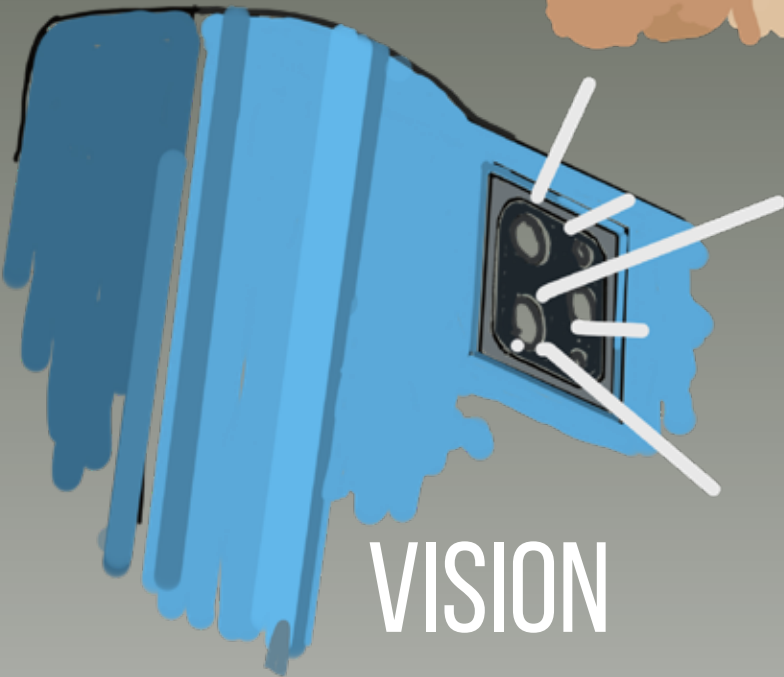
HANDHELD



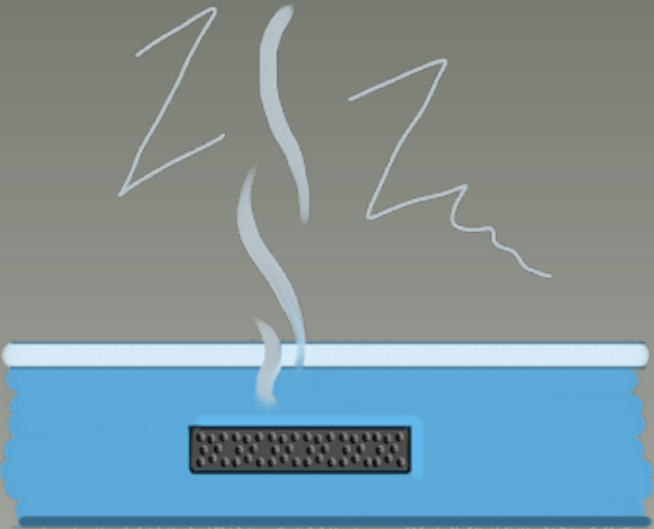
SOUND



HAPTIC

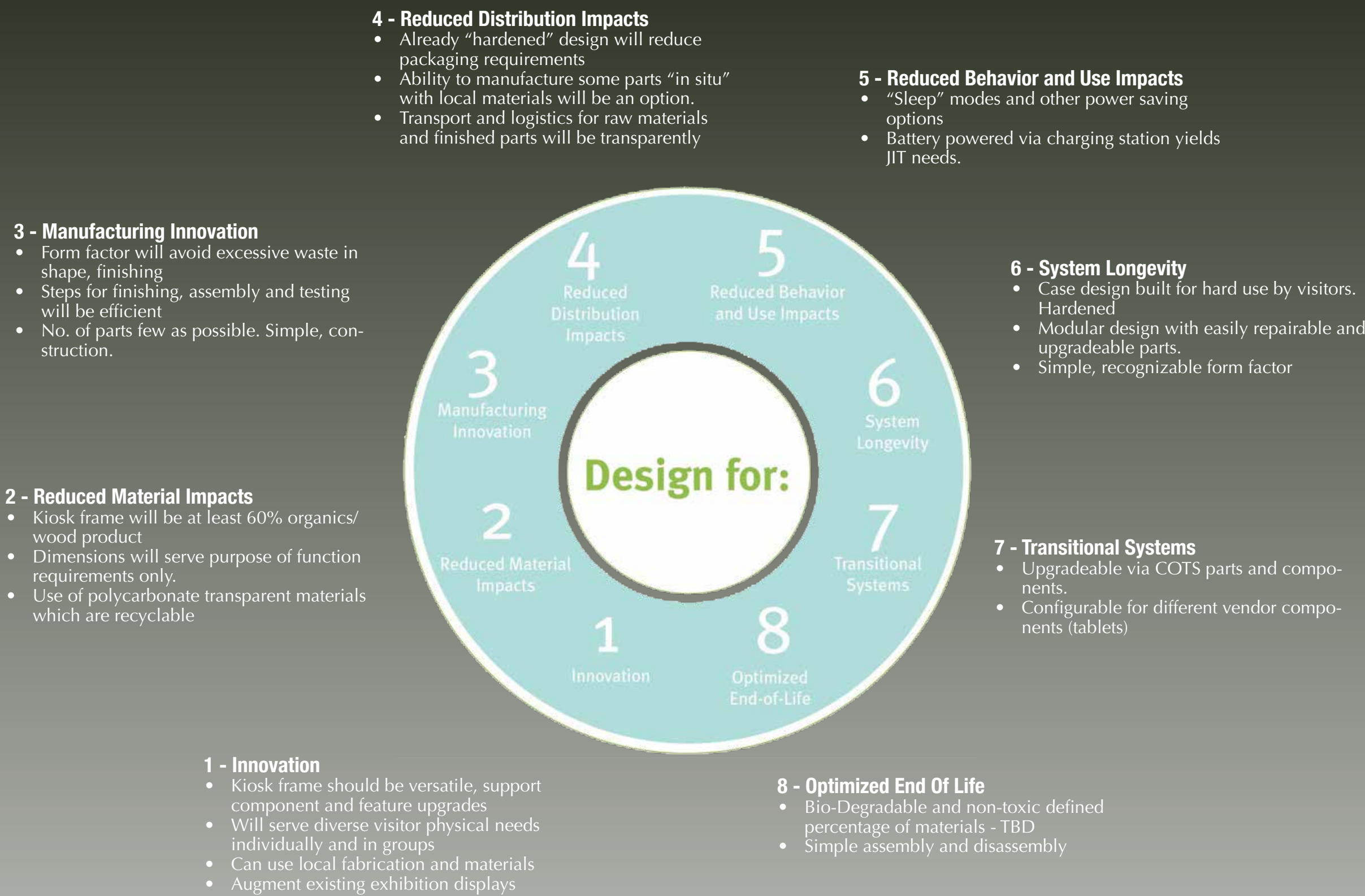


VISION



SCENT

SUSTAINABILITY STRATEGY



SCRATCH V1 - V2

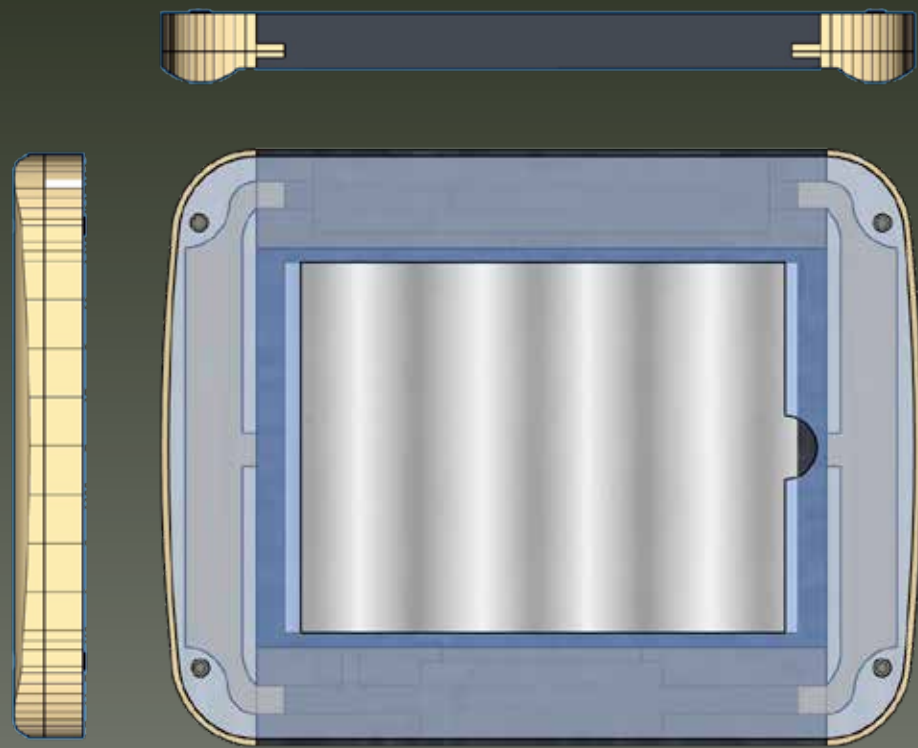
V1



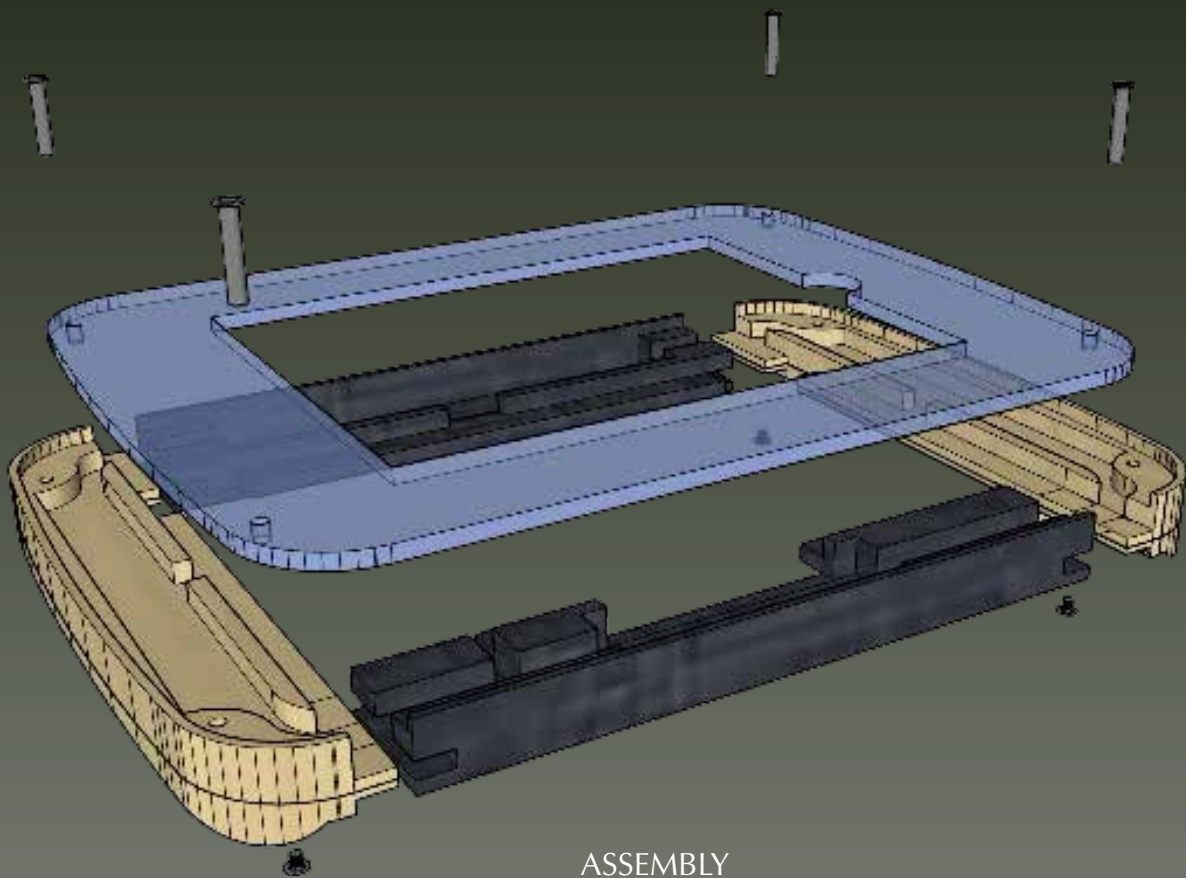
V2



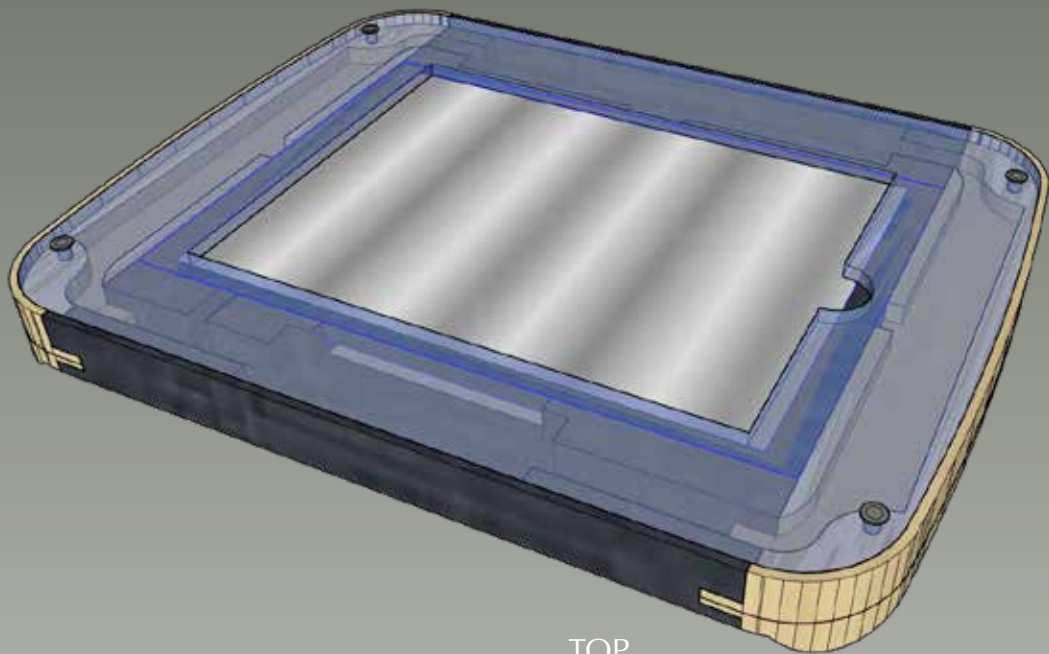
3D MODEL



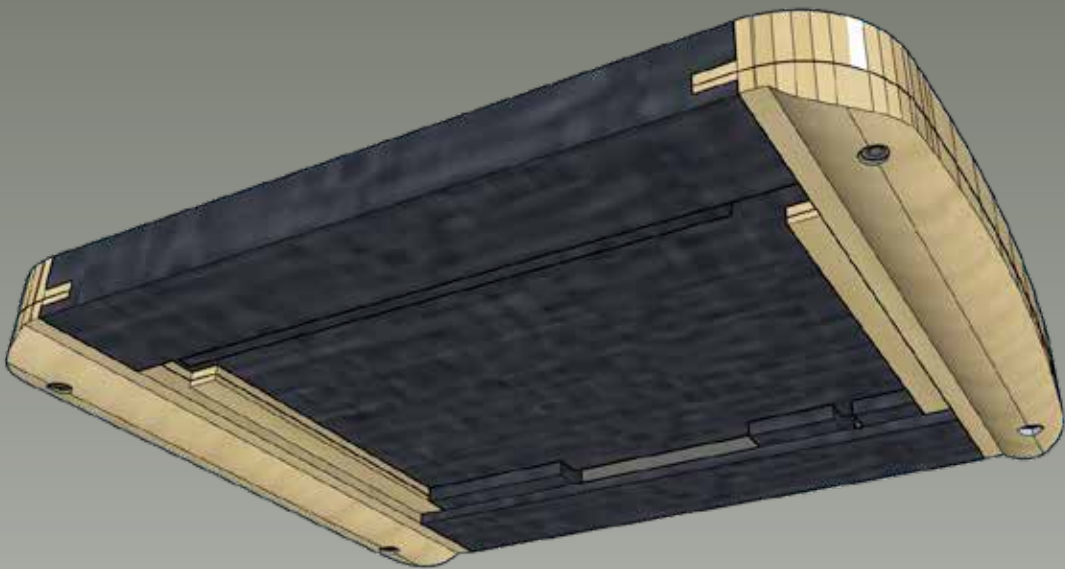
ORTHOGRAPHIC



ASSEMBLY



TOP



BOTTOM

MARKET MAP

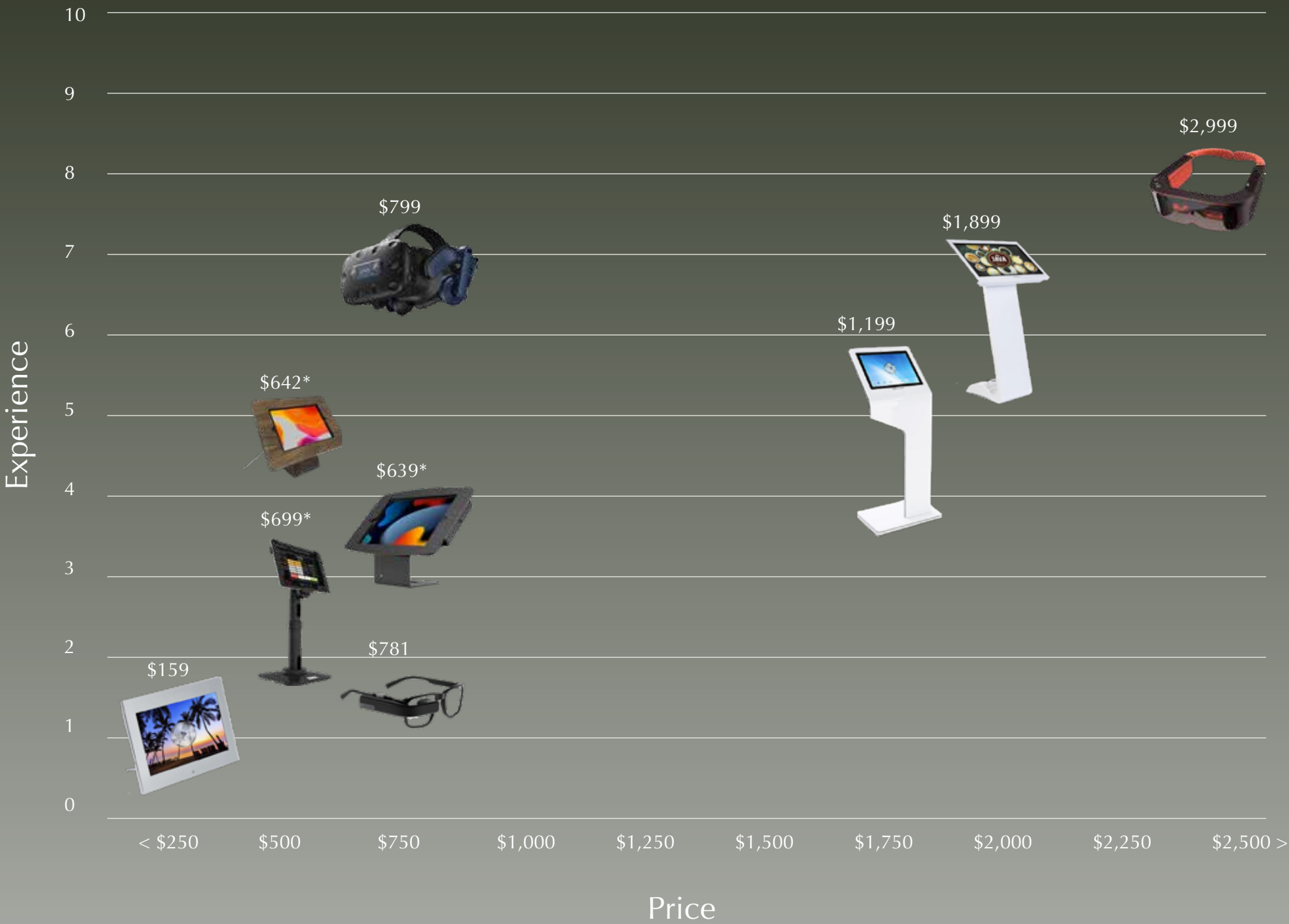
Exhibition/Entertainment Displays/AR
Types:

- Freestanding
- Wall Mounted
- Wearable/Headset
- Desktop

A market map focused on a variety of display/AR approaches shows both all-in-one products as well as platforms for tablets.

None offer modular capabilities beyond vision based augmented reality.

EXPERIENTIAL VERSUS PRICE



* Note: Price of a representative \$500 tablet added

BILL OF MATERIALS

Portal AR BOM/Costs		Material Costs							Labor - \$18/HR				
Component	Desc.	Grams	Pounds	Qty	Item Cost/pound	Fab. Duration	Weight (Pounds)	Cost	Cutting to Size	Shaping/Joining	Sanding/Prepping	Finishing	Hours
Right/Left Handles	PLA	142	0.31	2	\$3.1306	11:30:00	0.626	\$1.96	0	0.25	0.5	0.5	1.43
Top/Bottom Bars	PLA	186	0.41	2	\$4.1006	13:09:00	0.820	\$3.36	0				
Acrylic Surface (.220)	Acrylic	324	0.71	1	\$2.0000	0:10:00	0.714	\$1.43	0.18				
Fasteners(4) - Sex Bolt	Steel	5	0.01	4	\$0.0200	0:00:00	0.044	\$0.00	0				
USB Hub/Cable	System	73	0.16	1	\$10.0000	-	0.161	\$10.00					
Packaging - Top Bar	Cardboard	50	0.11	1	\$0.0300	0:00:00	0.110	\$0.00					
Packaging - Bottom Bar	Cardboard	50	0.11	1	\$0.0300	0:00:00	0.110	\$0.00					
Packaging - Top Bar	Cardboard	50	0.11	1	\$0.0300	0:00:00	0.110	\$0.00					
Packaging - Top Bar	Cardboard	50	0.11	1	\$0.0300	0:00:00	0.110	\$0.00					
Shipping Box	Cardboard	150	0.33	1	\$0.0300	0:00:00	0.331	\$0.01					
Totals		657	1.45		\$9.25	24:49:00	2	\$16.78	\$3.24	\$4.50	\$9.00	\$9.00	\$16.74

PRICING

MATERIAL AND LABOR COSTS - \$33.52

MARKUP - X4

MARKET PRICE - ~\$135.00*

*Plus additional cost of COTS iPad(purchased separately) of \$550.

AR CAPABILITIES

VIEW-PORT

Using IOS/Android AR capabilities, view augmented reality content blending elements (information, objects) into any scene viewed through the tablet camera

SCENT

The top “rail” module may contain additional AR capabilities such as scent generation. With easy plug-and-play cartridges for refills and diverse experiences.

SOUND

The base model uses out-of-the-box tablet sound, but that can be enhanced with modular speakers in the left and right stiles for enhanced sound quality and amplification.

HAPTIC

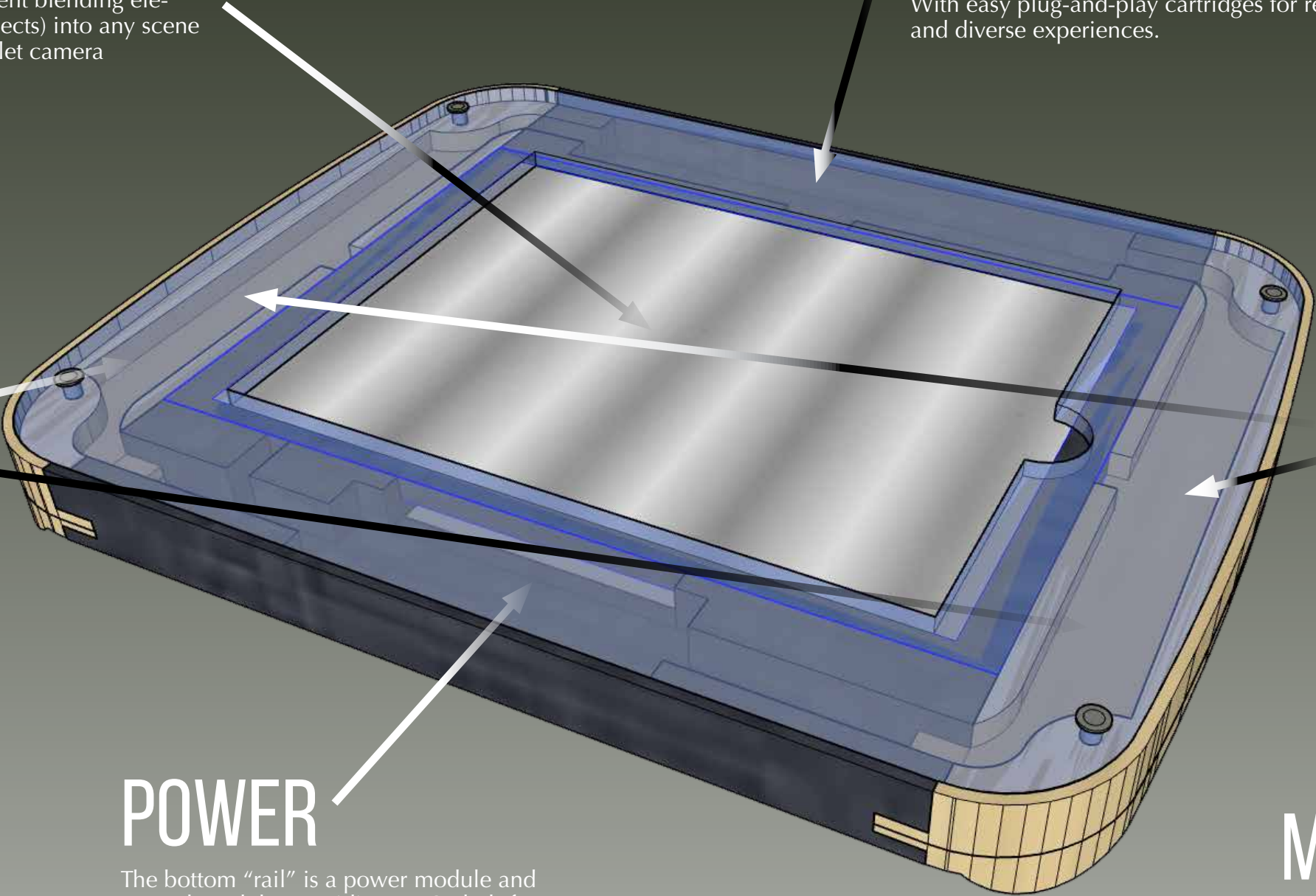
Both left and right stiles can feature plug in modules providing haptic feedback.

POWER

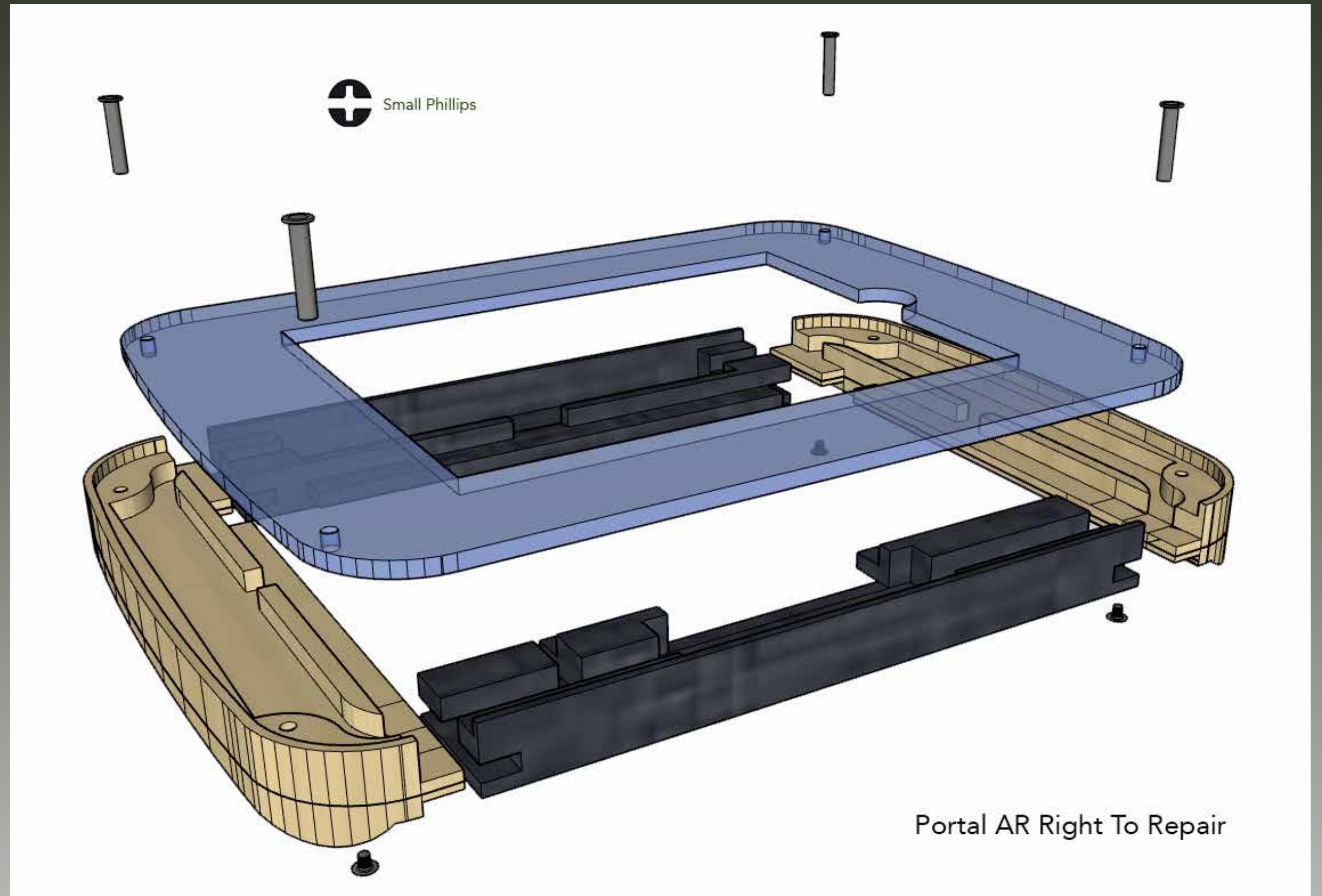
The bottom “rail” is a power module and control module, providing a USB hub for interconnects and additional battery power for enhanced AR capabilities.

MODULAR

AR Portal is a modular system, using as much commercial-off-the-shelf hardware as possible. Maintenance is simple (four screws) and replacement of failed components can be easily completed with simple tools.

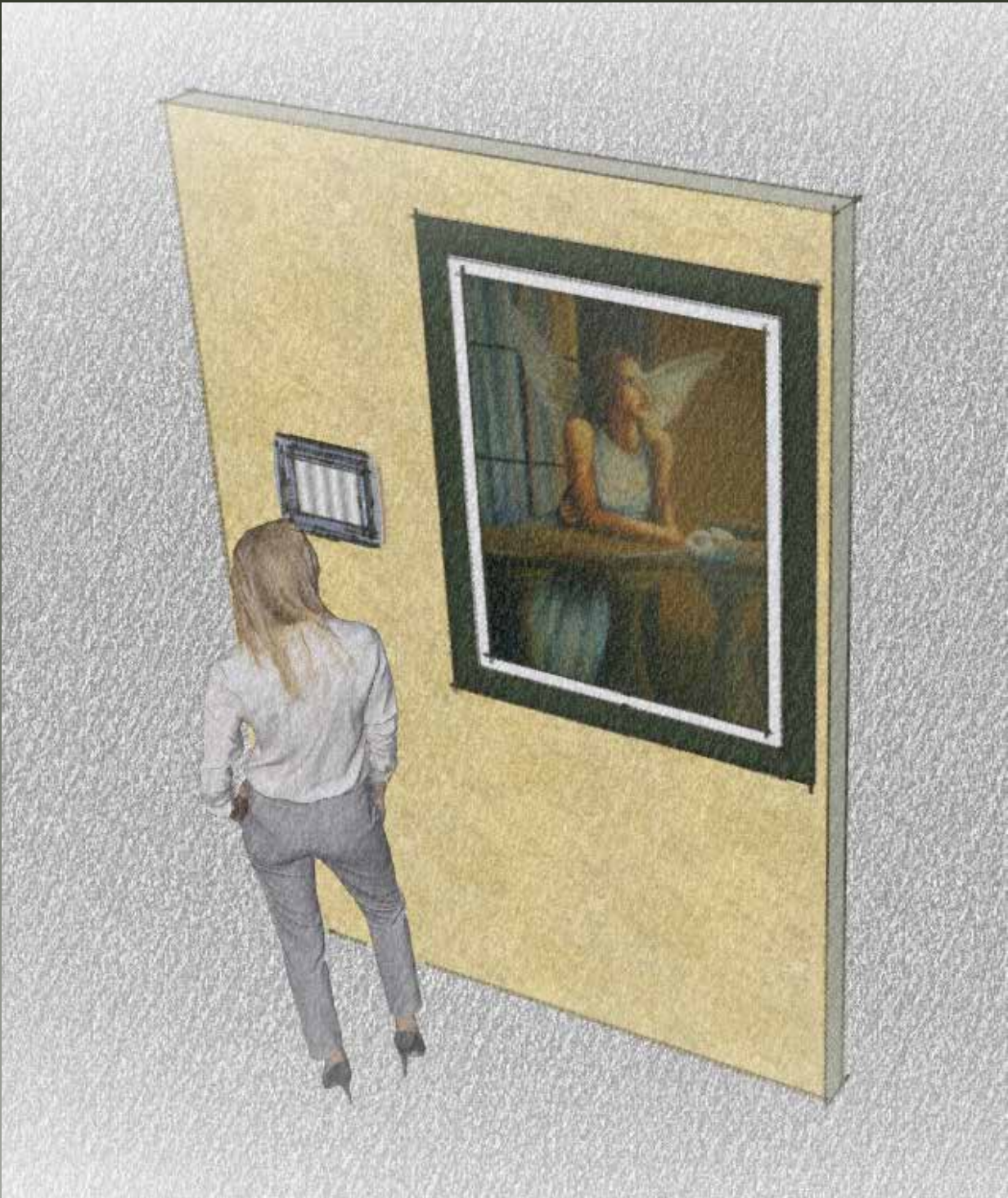


RIGHT TO REPAIR



CONTEXT

WALL MOUNTED



KIOSK



HANDHELD



THANKS!
QUESTIONS?!