



Humulo VR Pre-Trip Inspection

By: Ben Westergreen, Bruno Cebollada, Erick
Leclerc & Nick Dutka



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The Team





Ben Westergreen



Full Stack Designer

- UX Research
 - UI Frontend & Backend
 - Environment, Lighting & Optimization
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Ben Westergreen

Personal Project: NoizBox



Bruno Cebollada Fernandes



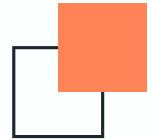
XR Product Designer

- UX Designer & developer;
- User Flow, step manager and core interactions.



Bruno Cebollada Fernandes

Personal Project: Let's Drink





Erick Leclerc

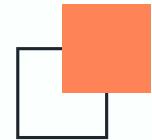
XR Producer & Programmer

- Communication Lead
- Haptics, A.I. Presence, In-Cab Interactions
- Bridging gaps: Scene Manager, Audio Overlapping, Animations



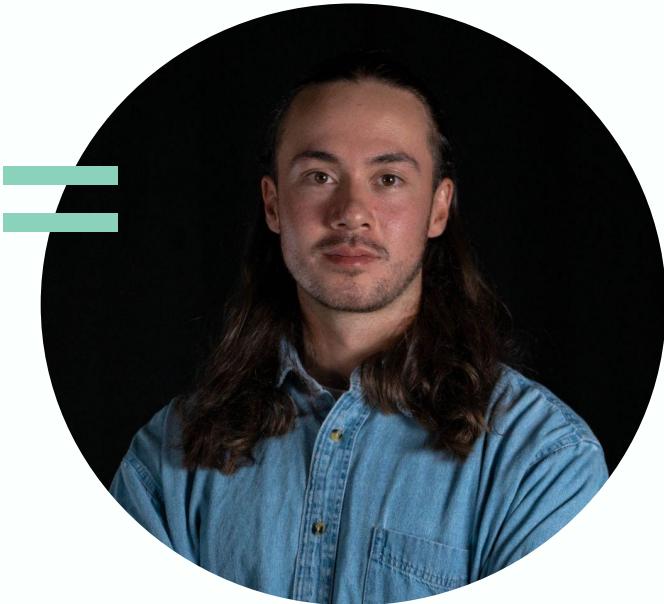
Erick Leclerc

Personal Project: Moto Manual

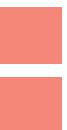




Nick Dutka



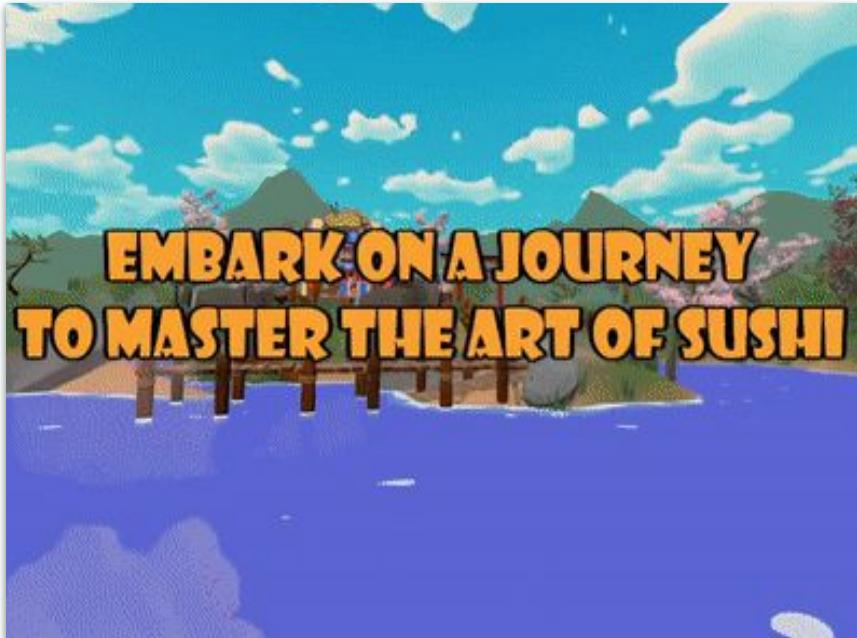
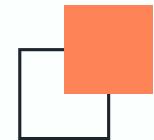
Technical Artist | Programmer

- Gameplay Interactions
 - 3D Asset Optimization + Refinement
 - Gameplay Optimization
- 



Nick Dutka

Personal Project: Neko Sushi 🐱



02

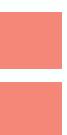
The Client





Client



- Offers VR Safety Training Modules
 - Government & Enterprise Solutions
 - Software Development & IT Consulting
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The Needs



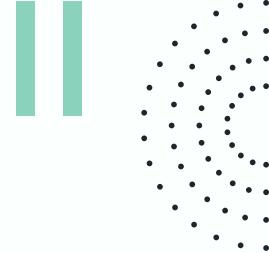
Training for
Commercial Drivers



Easily Scalable



Building Muscle
Memory



The Goals

Inspect Truck Components



Safety Precautions



Describe Types of Hazards



Recognize Requirements

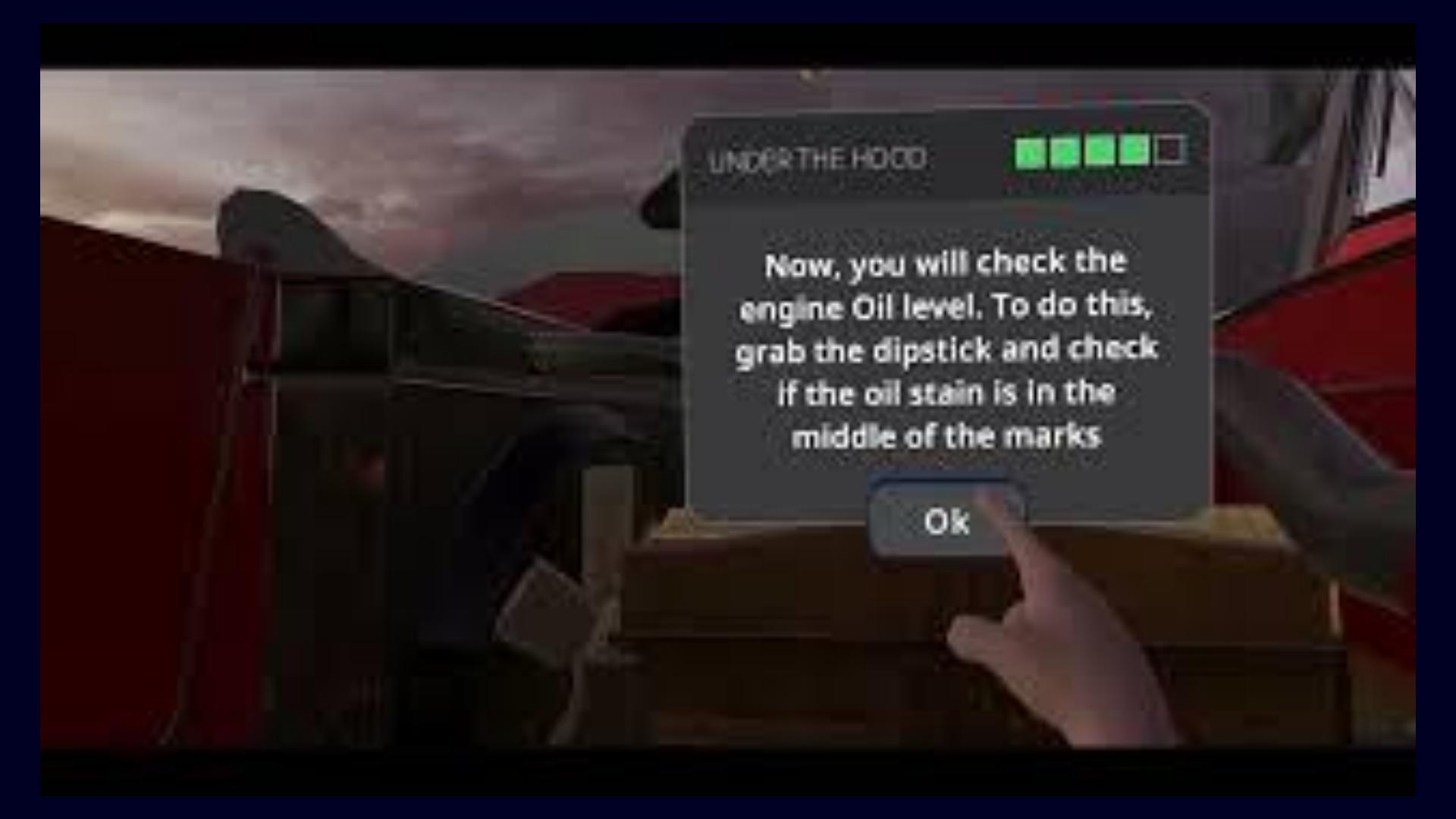




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Project Overview





UNDER THE HOOD



Now, you will check the engine Oil level. To do this, grab the dipstick and check if the oil stain is in the middle of the marks.

Ok

04

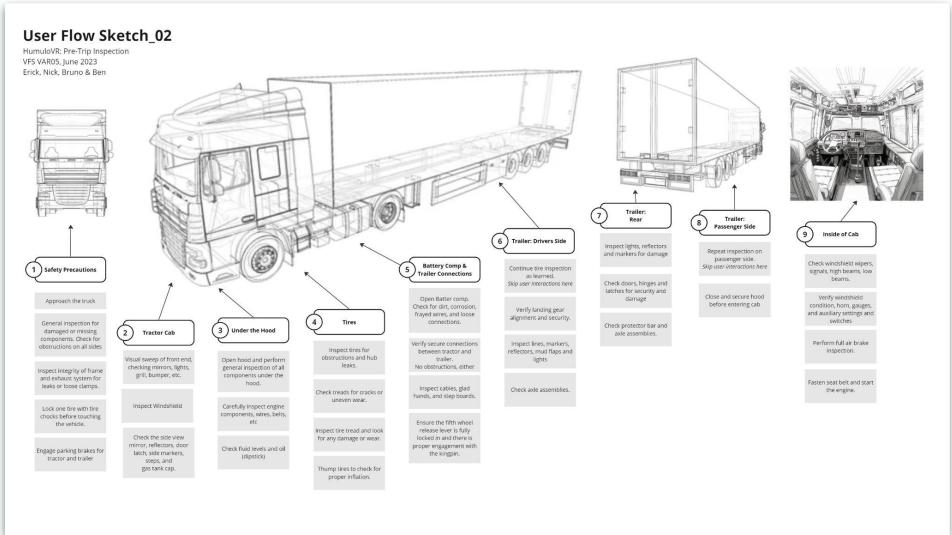
Discovery





User Flow

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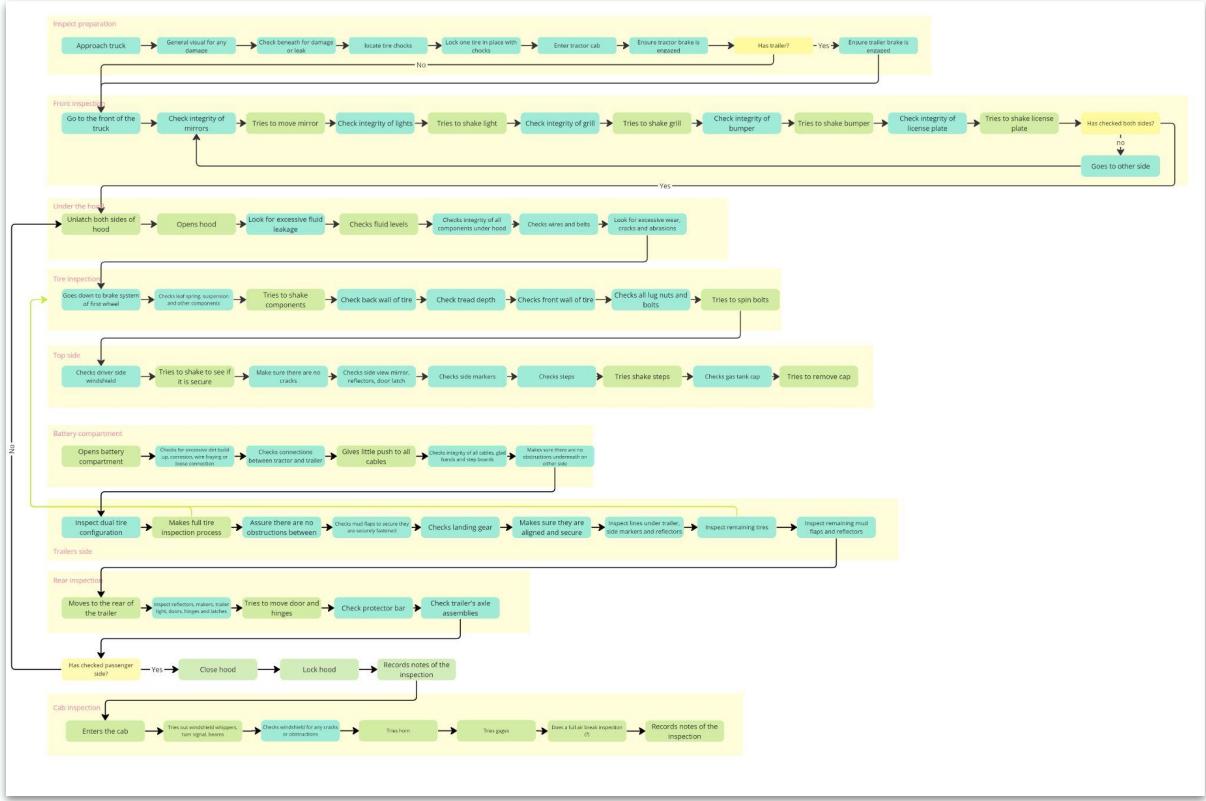


Challenge

The sequence of having an efficient training procedure.

Solution

Watching hours of Pre-Trip inspection train recordings and registering our findings.



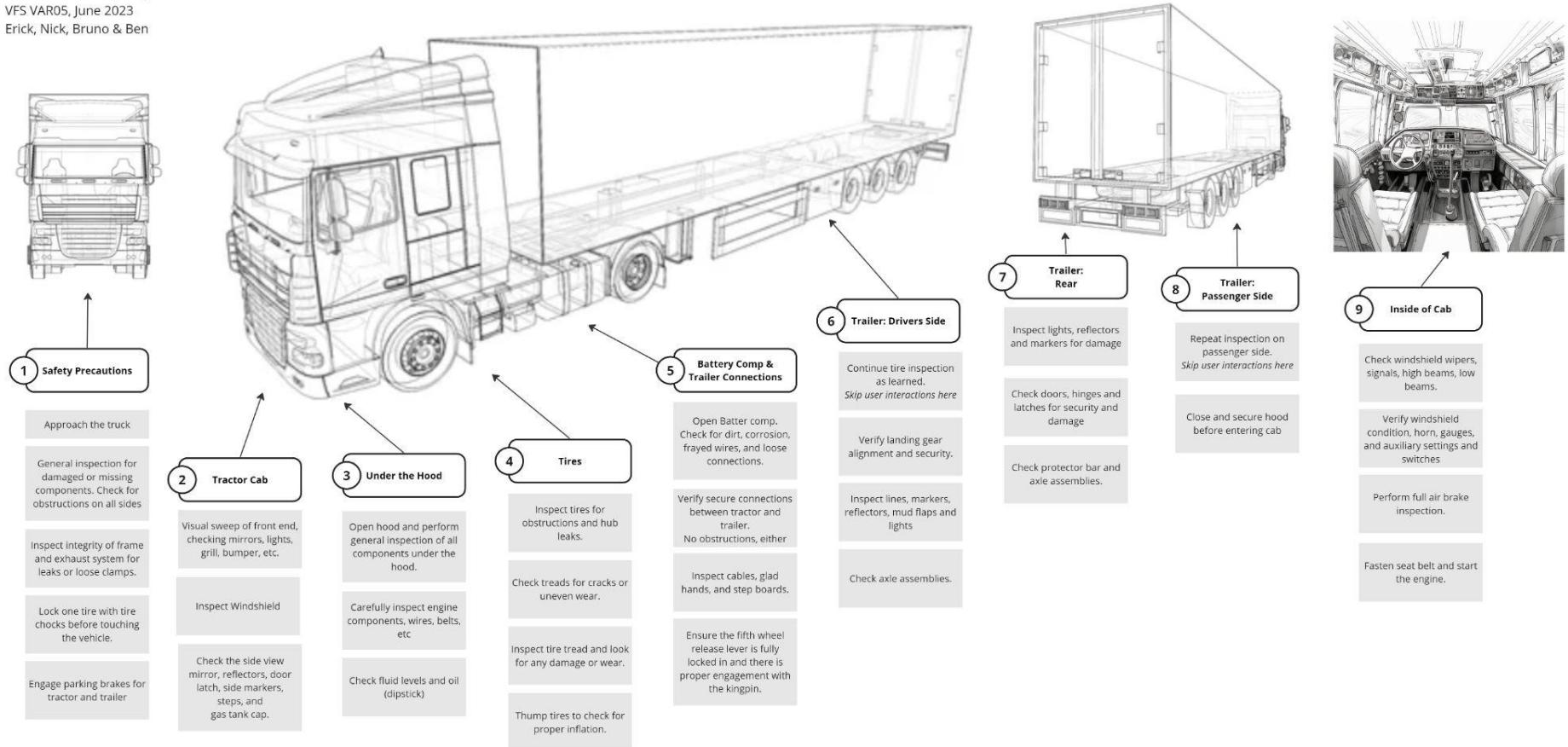
Register of Average Traditional Pre-Trip Inspection Training

User Flow Sketch_02

HumuloVR: Pre-Trip Inspection

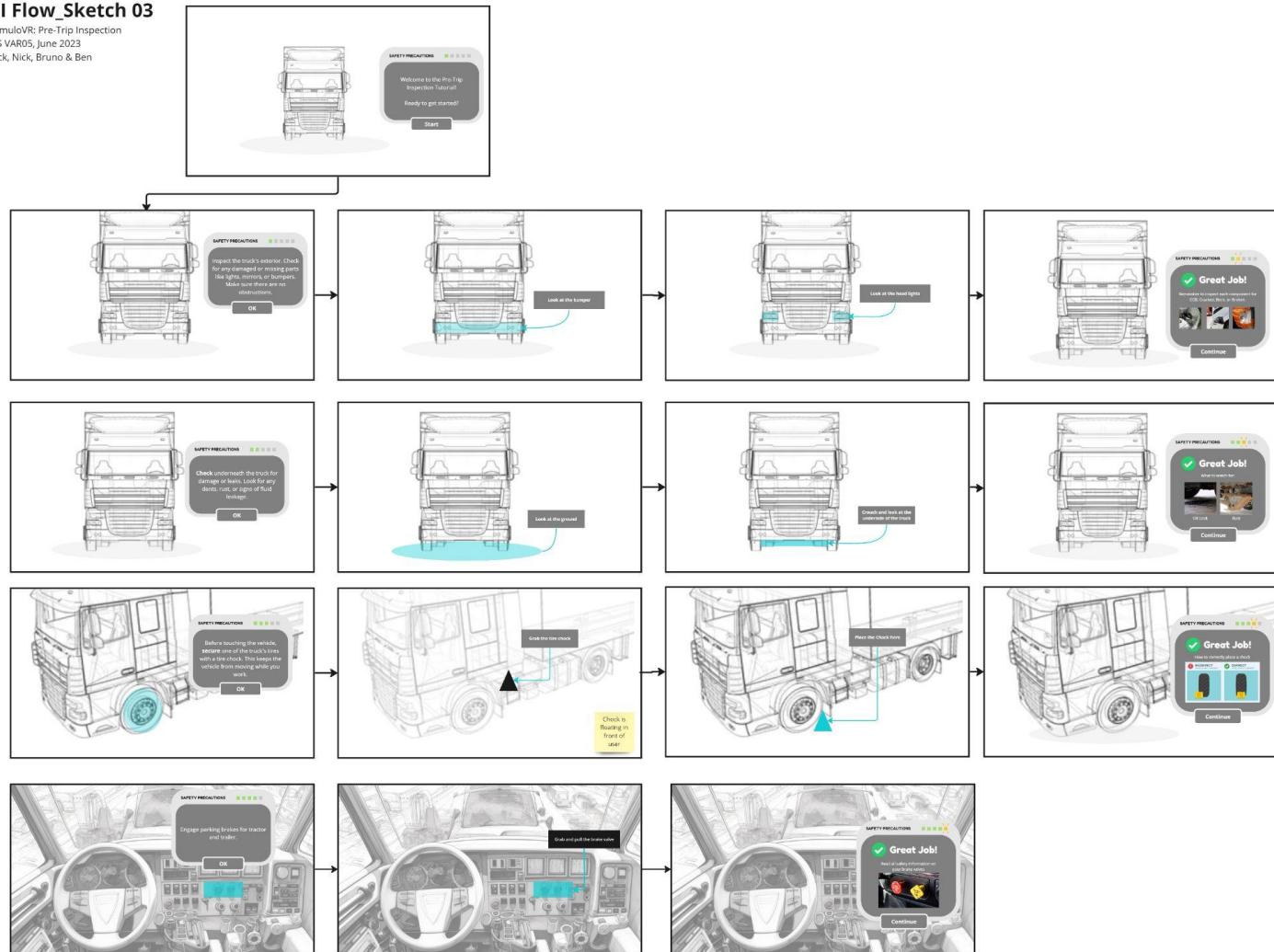
VFS VAR05, June 2023

Erick, Nick, Bruno & Ben



UI Flow_Sketch 03

HumulovR: Pre-Trip Inspection
VFS VAR05, June 2023
Erick, Nick, Bruno & Ben



Personas

Personas



Novice

- Background**
- Represents truckers with less than 1 year experience

- Pain Points**
- Lack of Experience
 - Need for Hands-on Practice
 - Limited Access to Physical Trucks
 - Limited exposure to VR technologies

- Opportunities**
- Step-by-Step Guidance:** Provide a simplified and easy-to-follow checklist for pre-trip inspections
 - Simulated Practice Scenarios:** Develop interactive scenarios; these could be identifying common issues or time-constrained inspections

- In-Context Training Environments:** Create diverse virtual environments, such as parking lots, delivery stops, etc.
- Detailed Inspection Points:** Enable John to closely examine specific components of the truck. Photographic References. Examples of equipment
- Troubleshooting Scenarios:** Incorporate simulated troubleshooting scenarios to resolve common issues that may arise during pre-trip inspections
- Progress Feedback:** Visually display users progress through training.



Experienced

- Background**
- Represents truckers several years of experience in the industry

- Pain Points**
- Skepticism about the effectiveness of VR training
 - No exposure to VR technologies
 - Lack of motivation to go through the training process again
 - Overconfidence in pre-trip inspection skills due to years of experience, resulting in a lack of interest in re-learning the material.

- Opportunities**
- Introductory tutorials** and guidance on using VR technology
 - User-friendly interface and intuitive controls** within the VR environment to enhance ease of use and minimize learning curve
 - Highlight changes** that are new to the Pre-Trip inspection regulations.
 - Incorporate interactive elements**, such as quizzes and simulations exercises, to make the training experience more engaging, immersive, and hands-on.



Multilingual

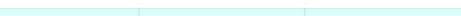
- Background**
- Represents truckers who learned English as a second language.

- Pain Points**
- Language Barriers
 - Limited Vocabulary
 - Cultural Considerations
 - Reading and Writing Skills

- Opportunities**
- Visual Representation:** Enhance the use of visual cues, animations, and diagrams to convey information effectively, reducing reliance on complex text-based instructions and accommodating learners with limited English language skills.
 - Simplified Language and Terminology:** Use simplified language and avoid jargon or technical terms whenever possible. Provide clear explanations and definitions for essential terminology to ensure comprehension by multilingual and ESL truckers.
 - Cultural Context Sensitivity:** Consider cultural context in the design of scenarios and examples within the VR training, ensuring that concepts and expectations are relatable and understandable across different cultural backgrounds.

- Main personas: Novice, Experienced, and Multilingual**
- Set the tone of the training instructions**
- Roadmap to meet the needs of our users**
- Depth and style of information teaching**

Journey Maps

Pre-Trip Inspection Experience Map				
 John Davis - Novice Trucker "Most this pre-trip inspection stuff is overwhelming. So many things to check, and I'm afraid I might miss something important."				
Steps	Step 1 Welcome to Environment	Step 2 First Interaction	Step 3 Inside the cab	Step 4 Completes First Stage
Key Actions	<ul style="list-style-type: none"> Read instructions Analyze vehicle Put hands on sight Look under truck for leaks 	<ul style="list-style-type: none"> Analyze the interior components Search for breaks Ensure breaks are activated 	<ul style="list-style-type: none"> Locate clipboard Check off stage on clipboard as "complete" Prepare to move onto the next stage 	
Doing	<ul style="list-style-type: none"> Looking around environment to get their bearings Looks at hands to get sense of self 	<ul style="list-style-type: none"> Read the instructions on the UI Sees the hint indicator for where to focus Sees feedback letting him know his gaze is being tracked Clicks down Touches different components to see what is measurable 	<ul style="list-style-type: none"> Looks around to understand where he is. Touches different surfaces to see how they respond 	<ul style="list-style-type: none"> Finishing the last step Grab clipboard in one hand Checking off the "Preparation" section of the clipboard using a finger
Touchpoints	Vehicle	Instruction	Gaze on Target	Physical Movement
Questions	<ul style="list-style-type: none"> Where do I go? What do I inspect first? What can I interact with? 	<ul style="list-style-type: none"> What do I grab? Where do I look? What am I looking for? 	<ul style="list-style-type: none"> How do I activate the brakes? What is interactive? 	<ul style="list-style-type: none"> How accurate is this document? How do I do next?
Emotions	  	  	  	
Opportunities	<ul style="list-style-type: none"> Teach basic VR interaction Explain the overview of the training module 	<ul style="list-style-type: none"> Rigid bodies on surfaces so interactions feel physical and have feedback Offer accessibility options for users who find clicking difficult Visual cues and feedback to make it clear that the user needs to touch to inspect 	<ul style="list-style-type: none"> Inspectable key interior elements Realistic looking interior to help with real world skill transfer 	<ul style="list-style-type: none"> Use a tablet instead of a clipboard as pencil is not needed . . .
Expectations	<ul style="list-style-type: none"> Clear instruction on what to do Wants to see realistic vehicle Doesn't want to be ticked Step description Step description 	<ul style="list-style-type: none"> Accurate hands interactions with components Interactions comparable with the traditional training Step description Step description Step description 	<ul style="list-style-type: none"> Wants to see a realistic cab Wants to grab wheel and touch dashboard components Put the alarm - - 	<ul style="list-style-type: none"> Wants more guidance on what to do now - - - -

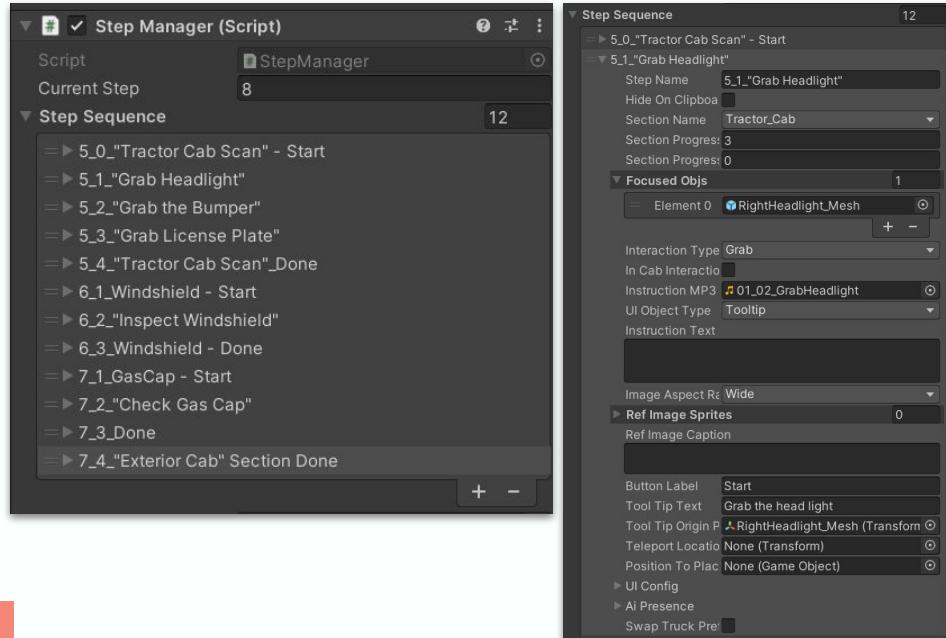
- Defined highlights of the experience
- Showed where more detailed instructions were required

05

Design & Development



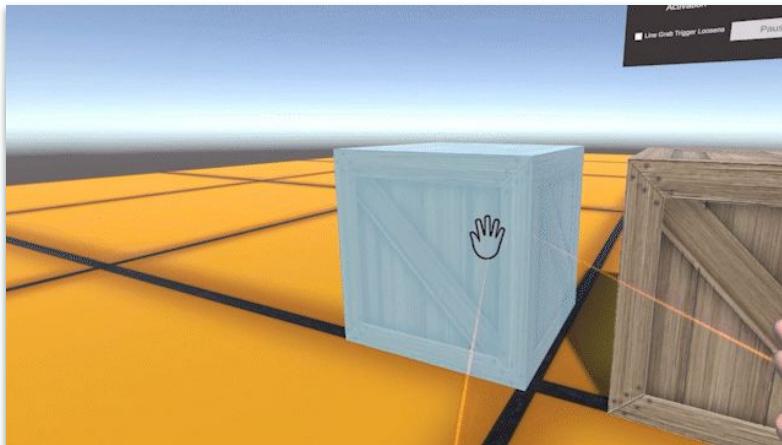
Step Manager



- First development priority
- Enabled to build training steps and interactions much quicker
- Easily scalable

Interaction Cues

First Iteration



Last Iteration



Interactions Inside the Cab

1. Windshield
2. Wipers
3. Turn Signal
4. High/Low Beams
5. Fog Lights
6. Horn
7. Seat Belt



Meet Pete



A.I. Pete

Presence Enhancement



Interaction Cues



Environment

Initial



Final

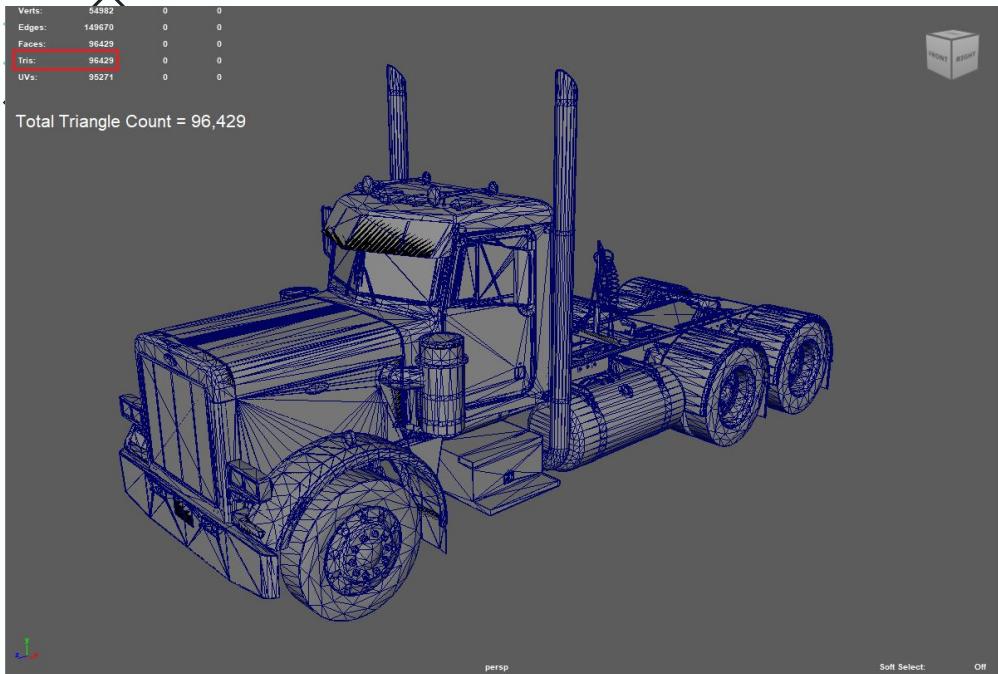


Optimization

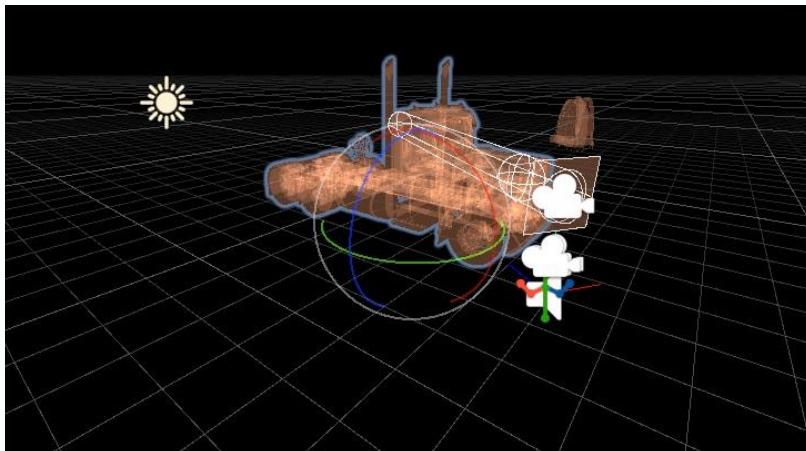
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Verts:	54982	0	0
Edges:	149670	0	0
Faces:	96429	0	0
Tris:	96429	0	0
UVs:	95271	0	0

Total Triangle Count = 96,429



Final Optimized Mesh < 100k tri's (Maya)



Optimized Mesh - Overdraw View (Unity)



Optimized Mesh - Dashboard (Maya)



06

Scope





Scope



Research comparative Pre-Trip inspection training experiences.



Iteratively design teaching, and interaction solutions for VR.



Develop teaching language, flow, and A.I. companion.



Back-end for sequential teaching and procedurally generated UI.



APK optimized for mobile VR HMDs.
Tested on Quest 2, designed for Pico 4.

07

Budget





Thanks!