MICHIGAN STATE UNIVERSITY

Project Plan

Adjust AR App

The Capstone Experience

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From Students…
…to Professionals

Functional Specifications

- Mobile application for users of high-end Herman Miller office chairs
- Uses augmented reality to assist in correct ergonomic adjustments
- Identifies chair automatically via camera
- Interactive 3D model of chair provides step-by-step adjustment instructions
- Provides alternative to on-site instructional sessions

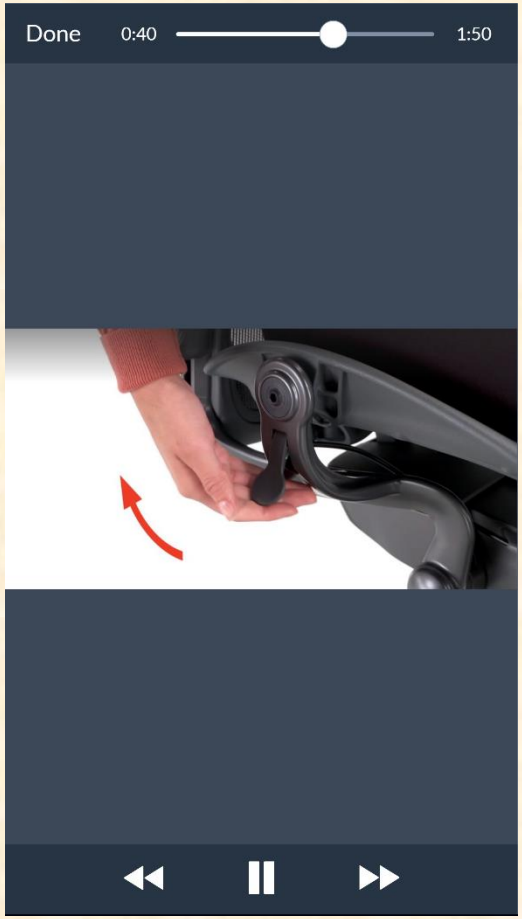
Design Specifications

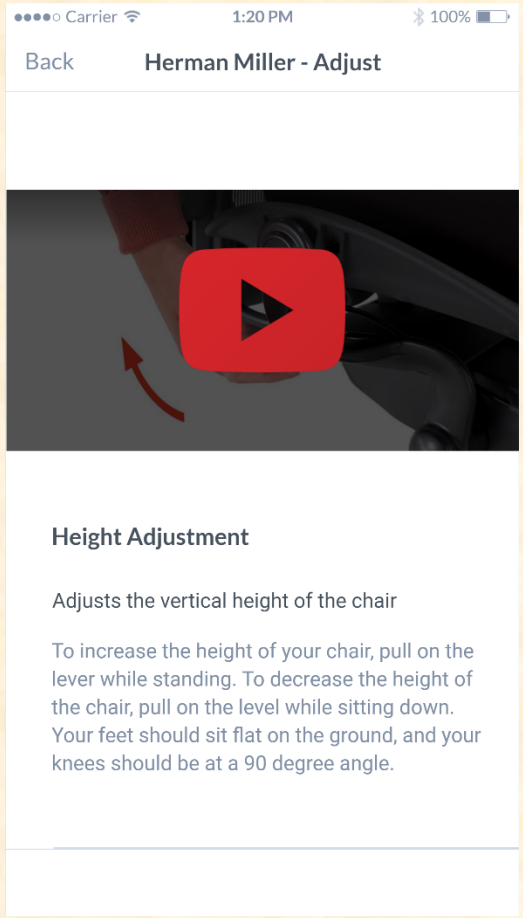
- Chair is identified using phone camera
- Once identified, provides a full walkthrough on proper ergonomic adjustments for chair via 3D model
- Allows returning users to view all adjustable parts or choose their model from existing gallery
- Tapping on a highlighted part provides text and video adjustment tips

Screen Mockup: Identifying Chair

Screen Mockup: Interactive 3D Model

Screen Mockup: Adjustment Instructions

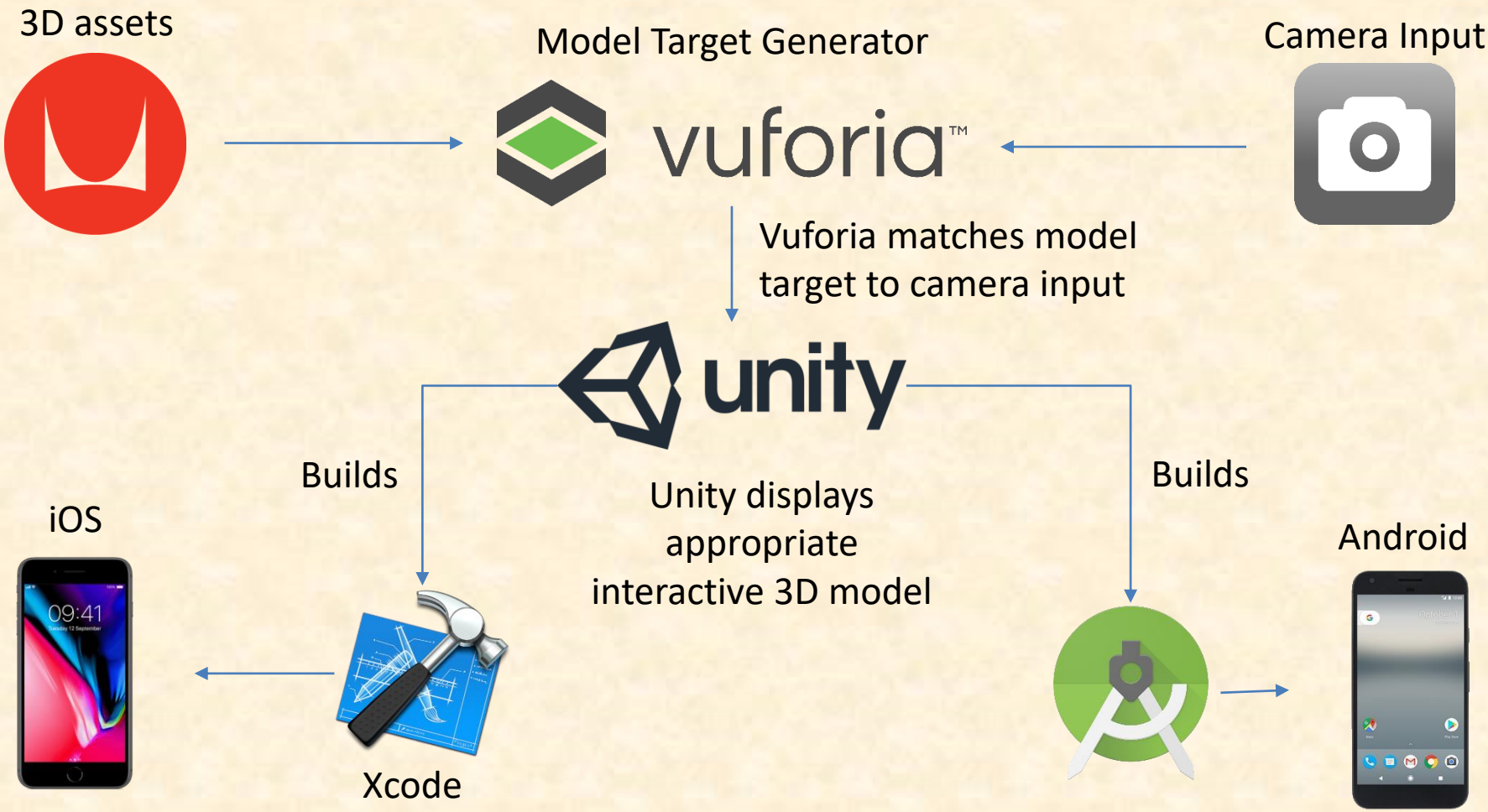




Technical Specifications

- Vuforia
  - Used Model Target Generator to create Unity Model Target assets
  - Model Targets are matched with camera input to identify chair
  - Vuforia AR camera is used to place the name of the chair above it in the camera view
- Unity
  - Interactive 3D models guide the user through chair adjustment through scene switching
  - Tapping on a highlighted part directs the user to the corresponding adjustment instructions
  - Builds natively to Android and iOS

System Architecture



System Components

- Hardware Platforms
  - iOS
  - Android
- Software Platforms / Technologies
  - Unity 3D (C#) for development and design
  - Vuforia for AR and image recognition
  - Blender for modification of 3D models

Risks

- Risk 1 – Recognizing chair models via camera
  - Experimenting and developing with Vuforia
  - Testing other solutions (OpenCV, Microsoft Computer Vision)
- Risk 2 – Properly integrating augmented reality
  - Built working prototype with Vuforia
  - Can fall back on Apple ARKit or other technologies
- Risk 3 – Testing multiple configurations
  - Herman Miller has provided us with fully-loaded models so that many possible configurations can be tested
- Risk 4 – Cross platform development
  - Using technologies that are natively cross-platform

Questions?