DirecTV Video Quality Rating & Analysis Tool

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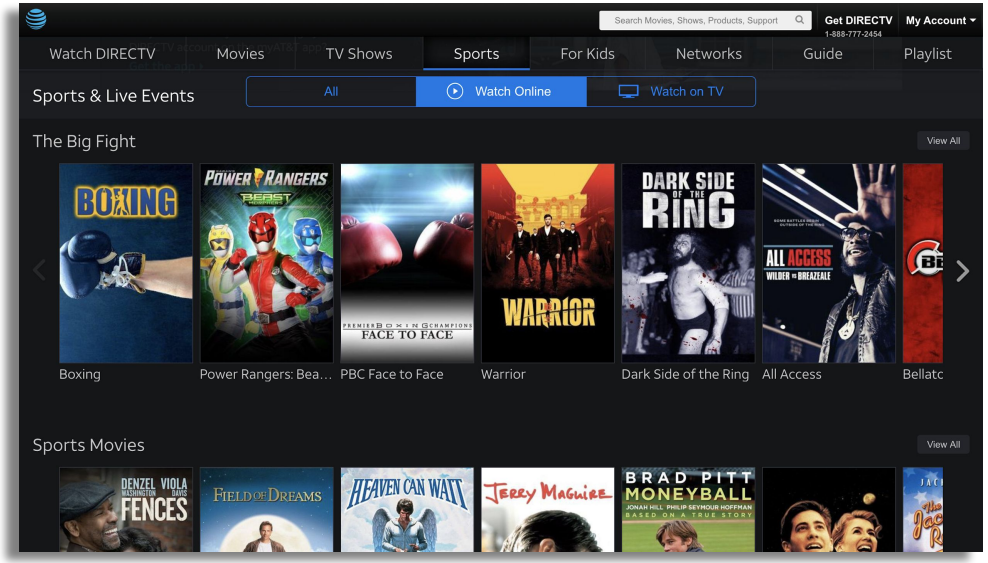
AT&T

The Problem

- DirecTV's business model is changing from satellite to streaming services.
- Costs increase per stream depending on the video bitrate.



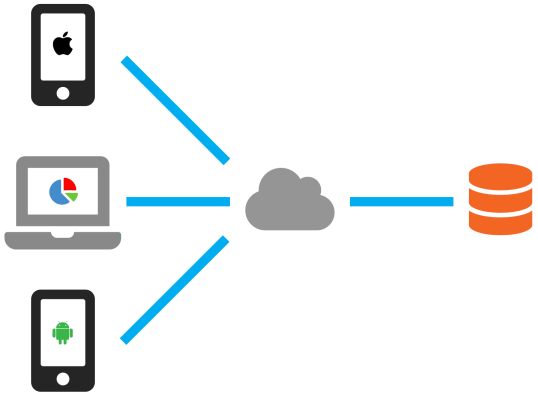
Ponaroth Eab

The Problem

- DirecTV's current Video Rating lab cost around $500,000 in equipment.
  - 4k TVs, 1080p TVs, Amazon Fire Sticks, Special Lighting, Servers, etc.
- The lab could only collect in-person user ratings, one rating at a time.

The Project

- **How can we minimize cost while maximizing video quality?**
- iOS and Android apps collect data on video quality from smartphones, tablets, and Smart TV devices.
- A web app allows for video management and data analysis.
- A Node.js server provides an API to retrieve and send data.
- MySQL database stores video, score, and user information.

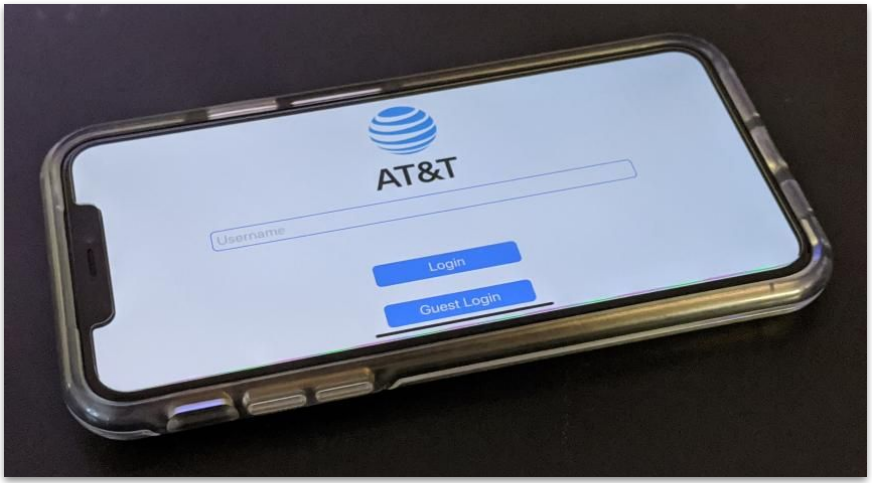


Challenges

- Learning Swift, JavaScript, React, Node.js, Kotlin, Git/GitHub, and frameworks
- Preparing for future OS/Software updates
- This project had been worked on for 1 year by Harvey Mudd College
    - Completely reworking database and API from Firebase (non-relational) to MySQL (relational).
    - Redesigning UI to become more intuitive and faster to use.
    - Refactoring code to implement good design patterns and unit testing.

iOS App

- The purpose of the app is to rate two videos with the same content but different video properties to see which users prefer
- This data is sent to a database



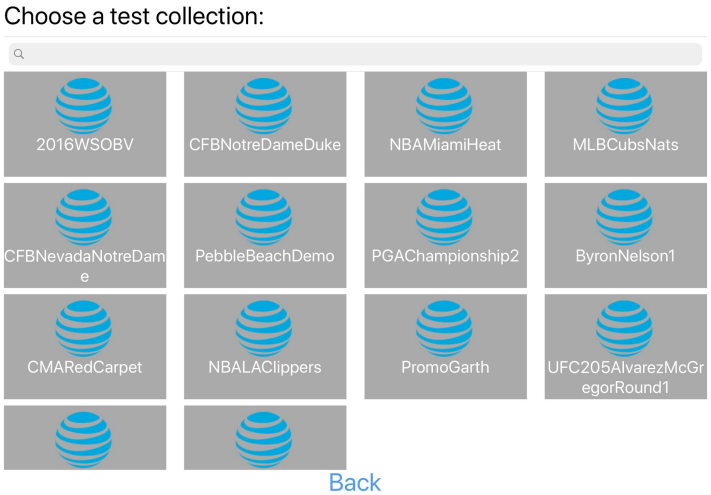
Daniel Ramirez

iOS App : What we did

- iOS app was functional, but was difficult to use and certain features weren’t working as intended.
- We worked with our liaisons to determine required changes:
  - User friendly buttons
  - Displaying scores results
  - Keeping user score
  - Added thumbnails to video selection page
  - Changed application flow
- Additional “Absolute Rating” application.

iOS App

Before



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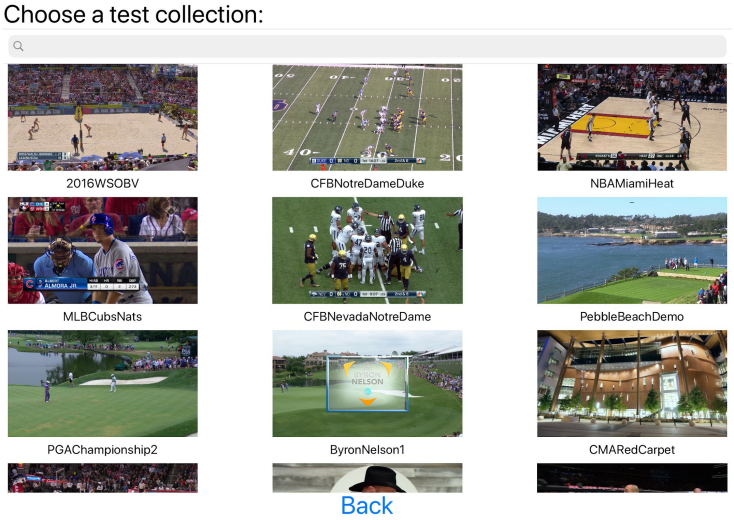

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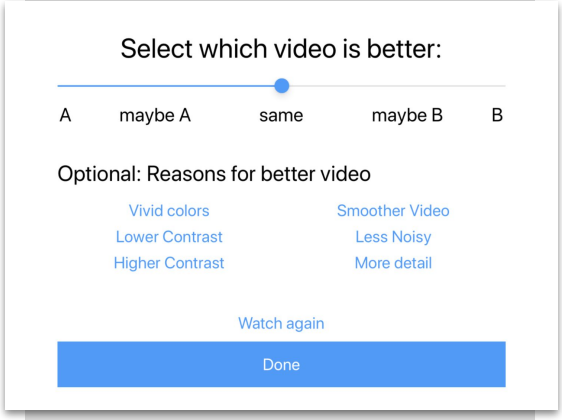
iOS App

Before



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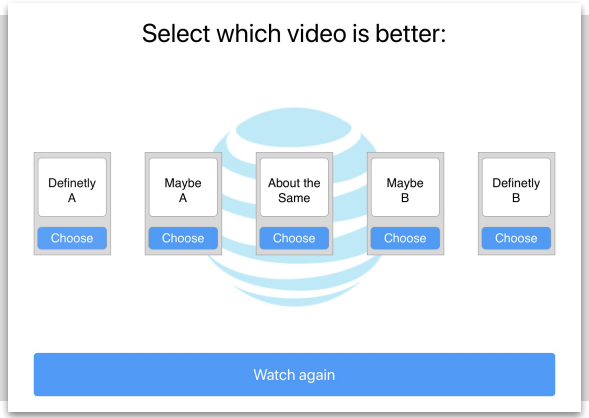
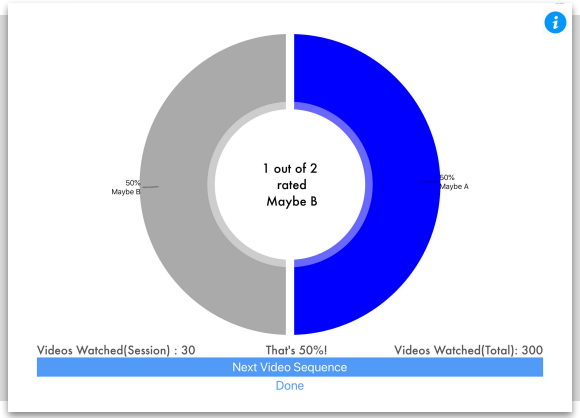




Daniel Ramirez

iOS Demo

Android App

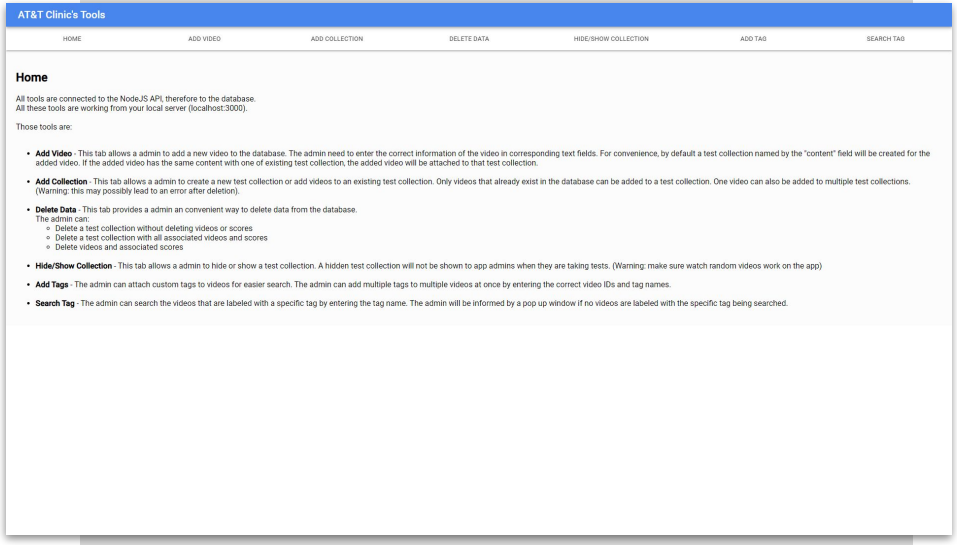
- Android app had not been developed, but was planned as a stretch goal
  - Expand user reach
  - Easier distribution and able to install on TV devices
- Planned to have the same design as the iOS app
  - Include optimization for Android TV devices (Chromecast, Firestick)

Web App: Introduction

- Dashboard to manage videos, collections, and settings for the mobile app
- Web app was half-functional
  - Difficult to use video management system
  - Issues with the tab bar
  - No data analysis pages
- We worked with our liaisons to determine required changes
  - Expandable sidebar
  - Additional pages for data analysis and raw data viewing
  - Update user-interface for video management to be easier to use
  - Settings page to toggle system-wide settings on mobile applications

Web App: Improved User Interface

Before



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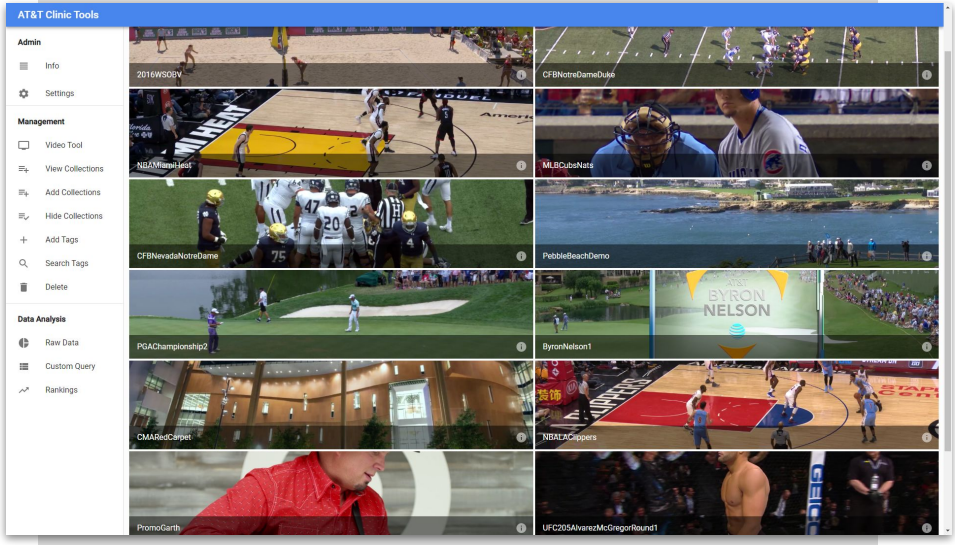

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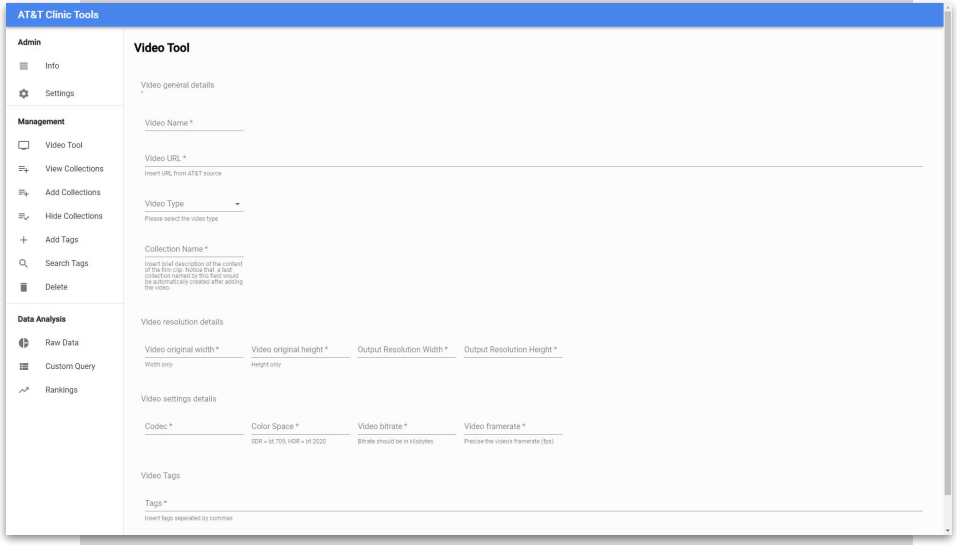
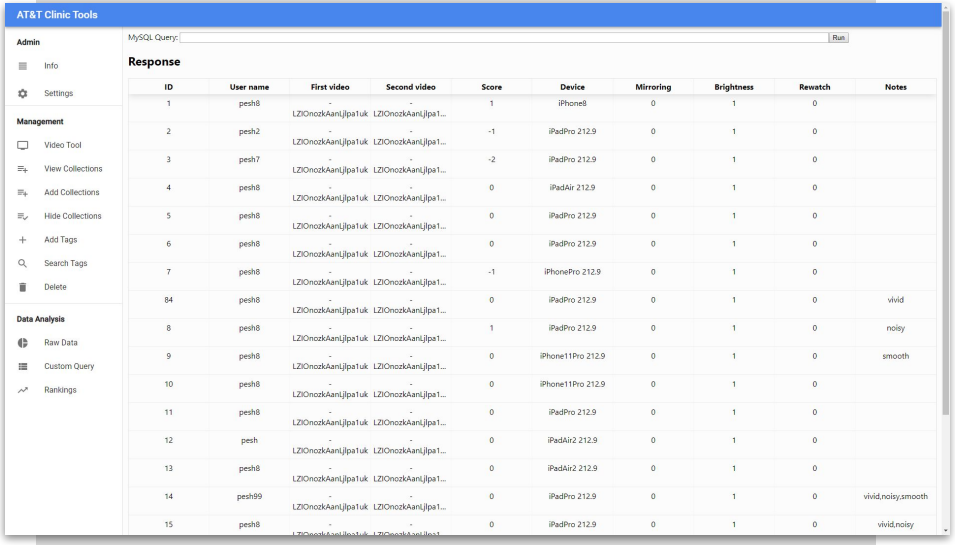
Web App: Additional Admin Tools

Video Tools



Custom Query



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API & Database

- Originally implemented with a Firebase (Non-Relational) database
- Client was “not convinced this was the best way to represent the data”
- Switched to relational database using MySQL
  - Completely Refactor API
  - Write script to convert data from the Firebase database into MySQL insert statements
  - Easily able to access and analyze more data than before
  - Able to run custom SQL queries