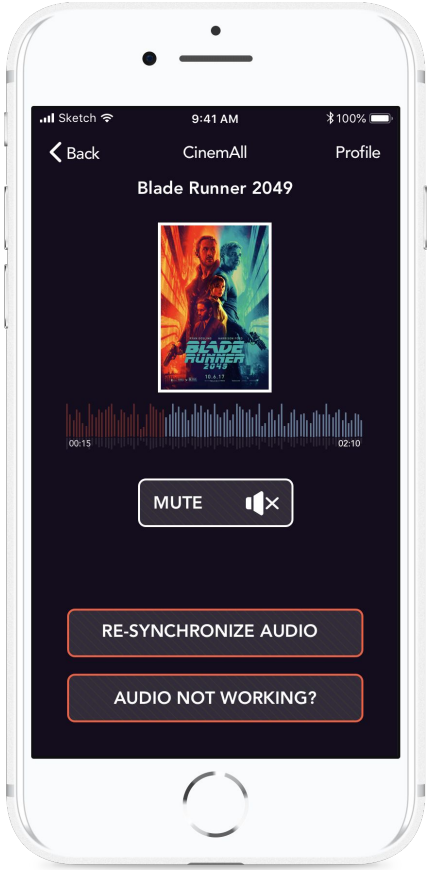
CINEMALL

In-theater movie experience for visually impaired users



Ruturaj Eksambekar

AUDIO/VIDEO DESCRIPTION

How visually impaired watch movies in theater

An additional narration track intended primarily for blind and visually impaired consumers of visual media and consists of description of what is happening on the screen or stage during the natural pauses in the audio, and sometimes during dialogue if deemed necessary.

WHAT WAS THE EXPERIENCE LIKE ?

User research to find out

01 Desktop research & competitive analysis

Goals

Get overview of existing products and problem space

Insights

ADA requires all theaters to be DV compliant
Most theaters don’t have enough DV devices
All current products work on RF technology with have range issue
Can be hard to find accessible device information online

AFB American Foundation for the Blind
Expanding possibilities for people with vision loss

DOLBY

SONY

FANDANGO

WHAT WAS THE EXPERIENCE LIKE ?

User research to find out

02 Semi structured interviews

Goals

Get qualitative data from both target users and theater management

Insights

Renting devices intrusive experience
Staff is poorly trained
Dirty and incompatible headsets
Device malfunctions a lot. Have to go back all the way to counter to get help

WHAT WAS THE EXPERIENCE LIKE ?

User research to find out

03 Field visits & Walkthroughs

Goals

To observe assistive device renting process and watch a movie using those devices

Insights

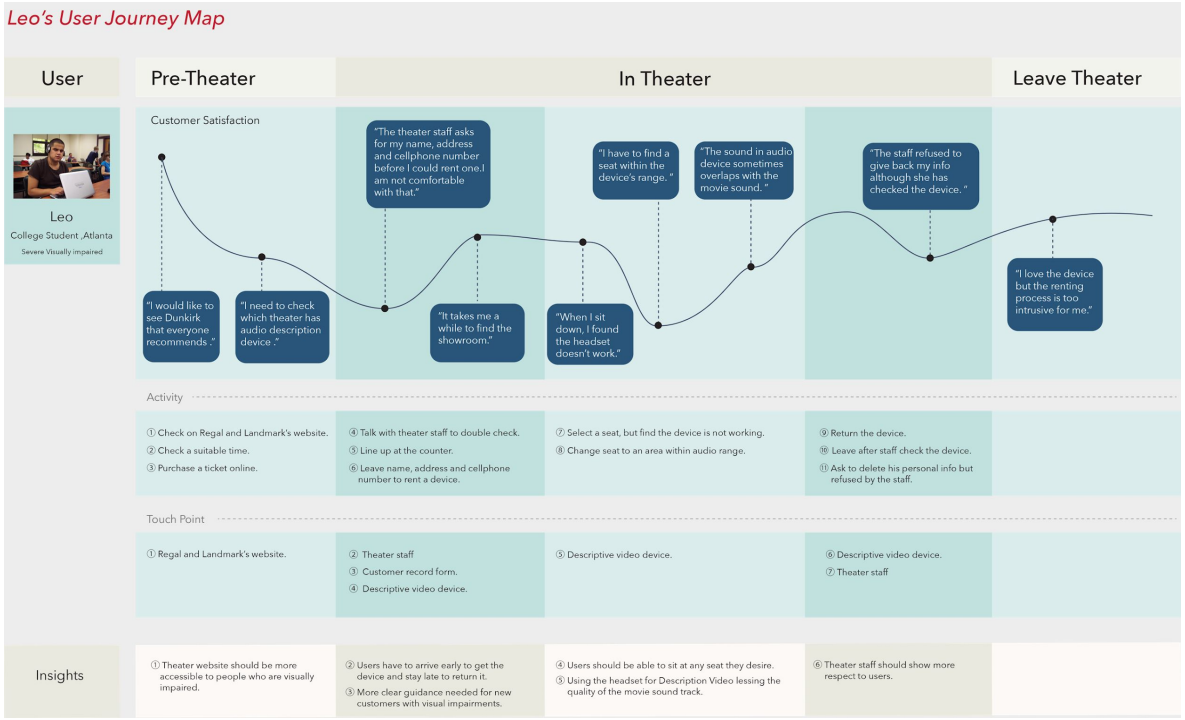
DV range issue inside theater, don’t work at some spots
Assistive device counters not close to ticket vending stalls
Need to arrive early and leave later than others
Hear overlapping audio from movie next door

LANDMARK THEATRES

REGAL CINEMAS

JOURNEY MAP

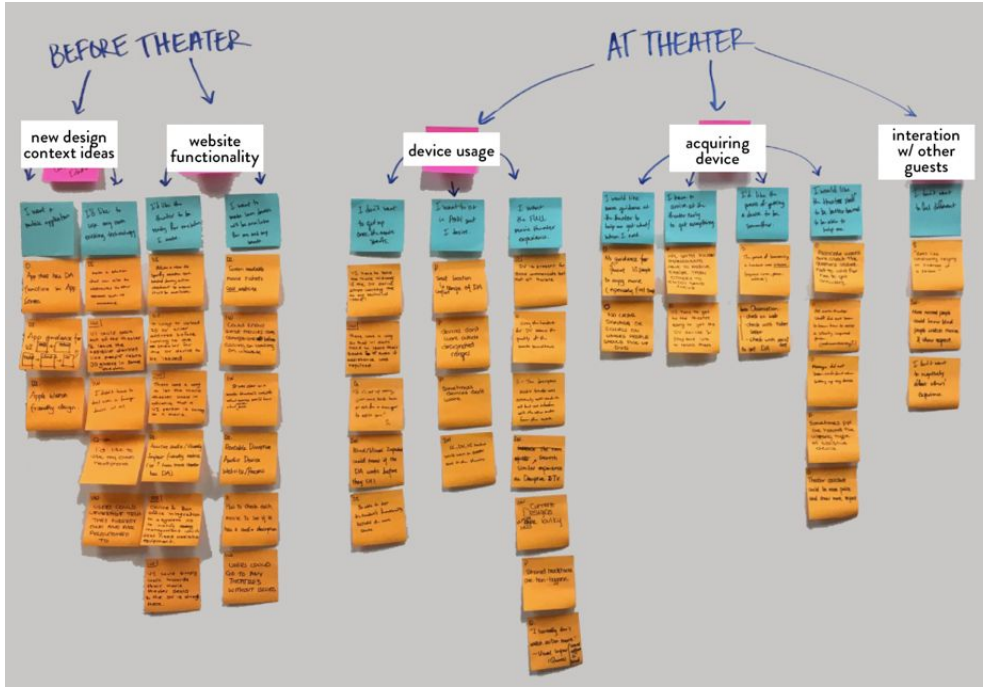
To help us understand the end-to-end experience and identify touch-points for design intervention



KEY USER NEEDS

After analysing all user research data using affinity mapping

- ➔ I wish to be better prepared before going to theater
- ➔ I wish it was easier to acquire appropriate DV device
- ➔ I wish there was better way to manage when device malfunctions



WHO’S THE TARGET USER

Based on our interview participants

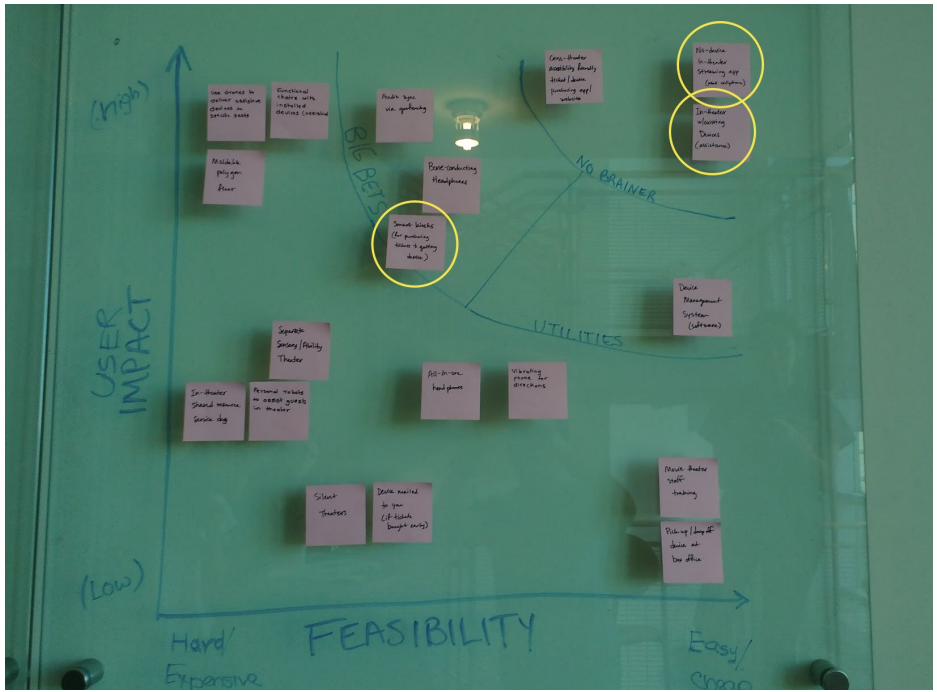
- ➔ Mild to severe visual impairment
- ➔ Loves watching movies, prefers going to theater
- ➔ Tech savvy
- ➔ Uses a smart-phone with accessibility features

IDEATION & NARROWING DOWN

Resolving conflict with user impact vs feasibility chart

Selected 3 ideas to design

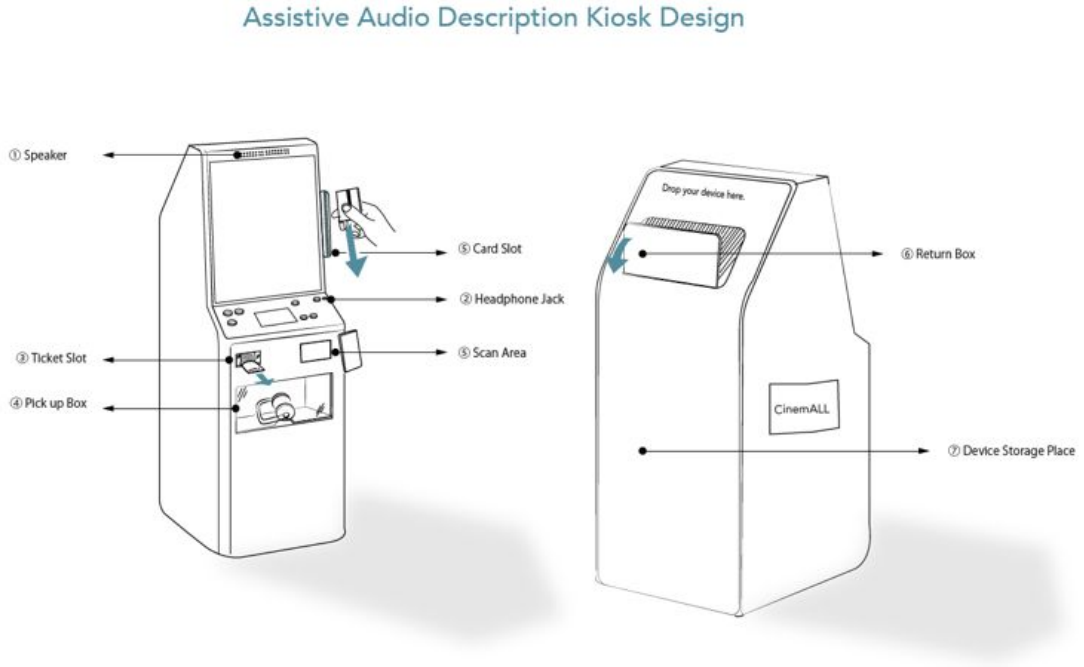
- Smart Kiosk
- In-theater service app
- Audio streaming app



SMART KIOSK

Idea - 1

- No theater staff interaction
- Universal design approach
- Return still an issue



IN-THEATER SERVICE APP

Idea - 2

- Leverage existing devices
- Theater staff better prepared
- Request help on your movie seat directly

AUDIO STREAMING APP

Idea - 3

- Use personal device
- No device renting hassles
- Airplane wifi analogy
- Synchronize audio Shazam style

FINAL DESIGN DIRECTION

User validation

Got feedback from target users and experts on wireframes

Audio Streaming app unanimous winner (5/5)

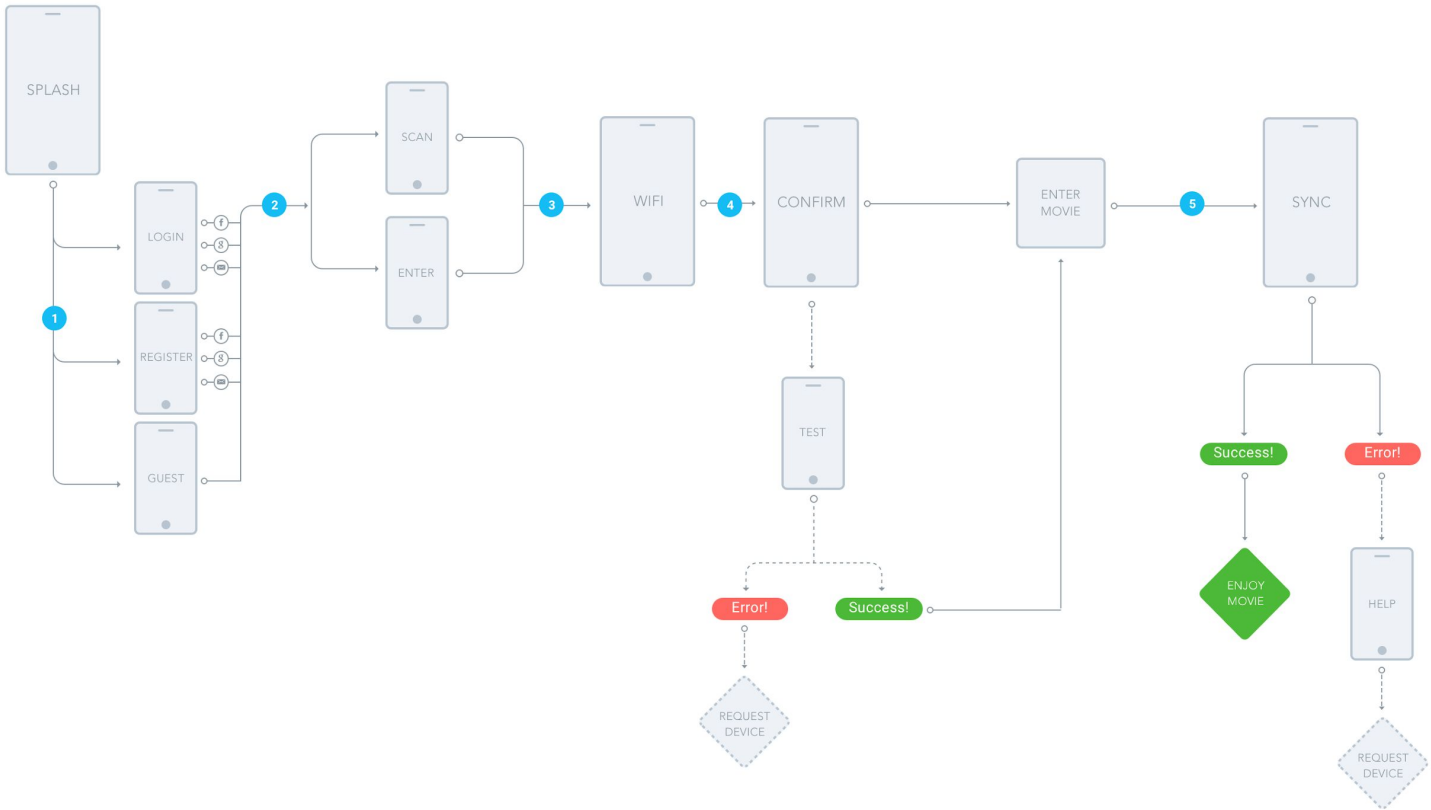
Getting help from movie seat & request DV device feature from Idea-2 integrated

Georgia Tech Center for Inclusive Design and Innovation

visAbility

CENTER FOR THE VISUALLY IMPAIRED

USER FLOW


SPLASH
LOGIN
REGISTER
GUEST
1
2
SCAN
ENTER
3
WIFI
4
CONFIRM
TEST
Error!
Success!
REQUEST DEVICE
ENTER MOVIE
5
SYNC
Success!
Error!
ENJOY MOVIE
HELP
REQUEST DEVICE

DESIGNING FOR ACCESSIBILITY

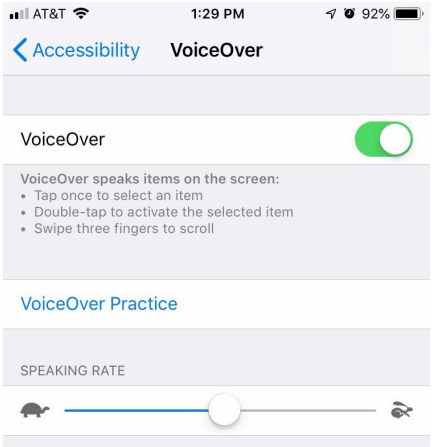
Studied Apple accessibility guidelines and personally used **voice over** for 2 days

Learnt interactions and haptic feedbacks for accessibility

Adhered **WebAIM** accessibility guidelines

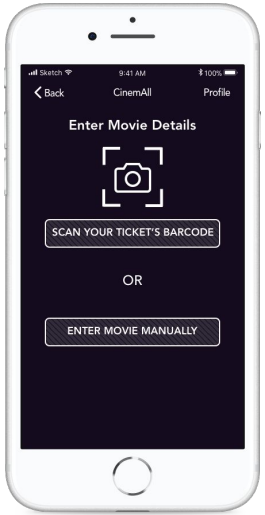
Contrast threshold **4.5 : 1** for passing
We doubled the passing value to be safe

Color palette selected keeping target user needs and usage context in mind

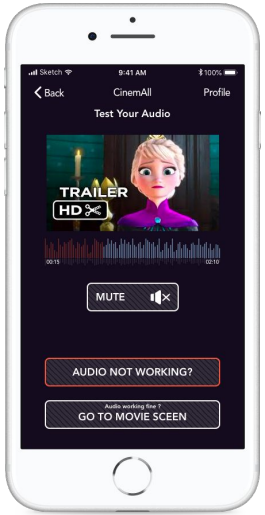


CINEMALL

An app to improve the in-theater movie experience for visually impaired users

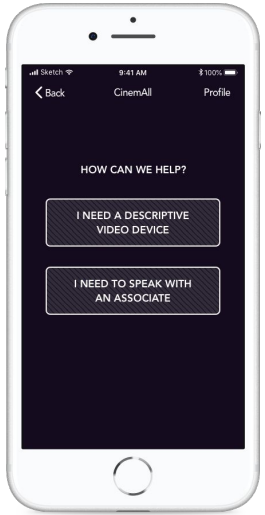


Select movie



Test audio before movie starts

Synchronize DV with theater audio



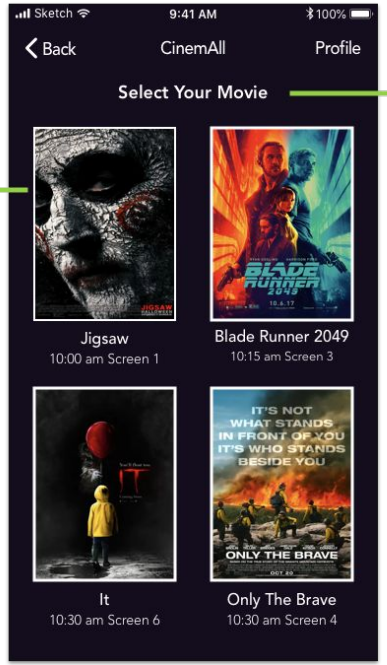
Request help from your seat itself

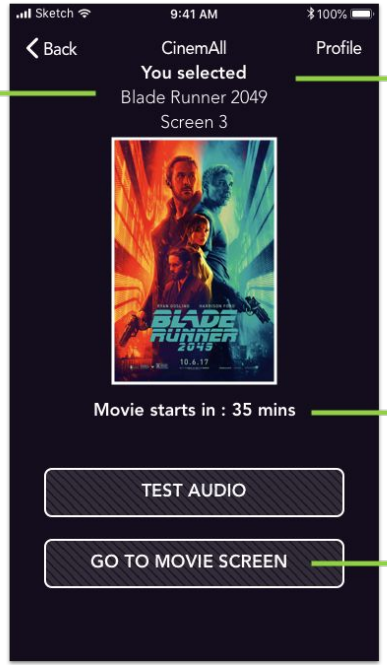
MOVIE SELECTION

Hi-Fi details

Clearly labeled instructions and selections

Large clickable displays of posters for easier identification and selection





Confirmation of correct movie provides ease of mind.

Timer allows users adequate amount of time to get to the seats

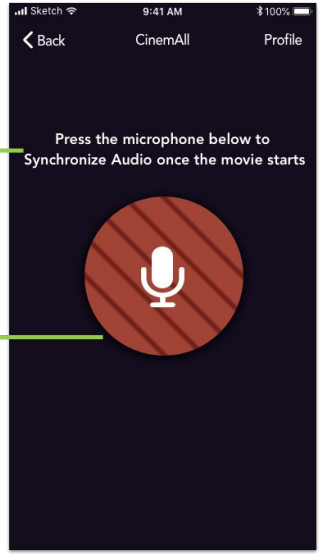
Buttons with patterned background and high contrast color to account for color-blind users

AUDIO SYNCHRONIZATION

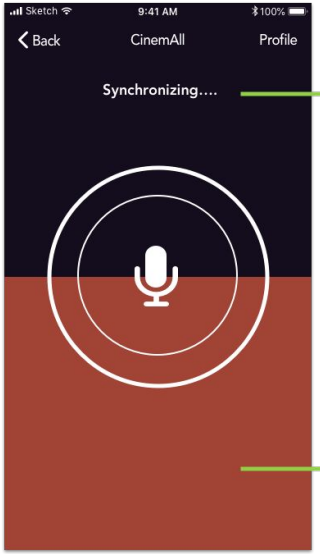
Hi-Fi details

Written instruction on how to use the interface for screen-reader

Buttons with patterned background and high contrast color to account for color-blind users



Progress in text along with visual indication



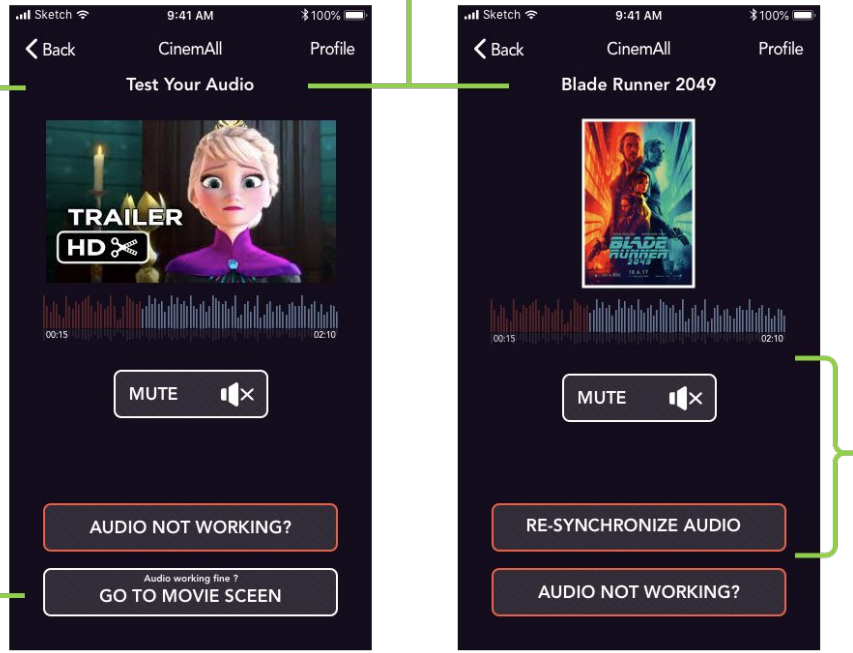
Full sceen synchronising bar for low vision users to understand system status

TEST & WATCH SCREENS

Hi-Fi details

Exact same layout for test-audio and watch movie interface for easier recall

Testing audio before user sits down in theater decreased the chances for error



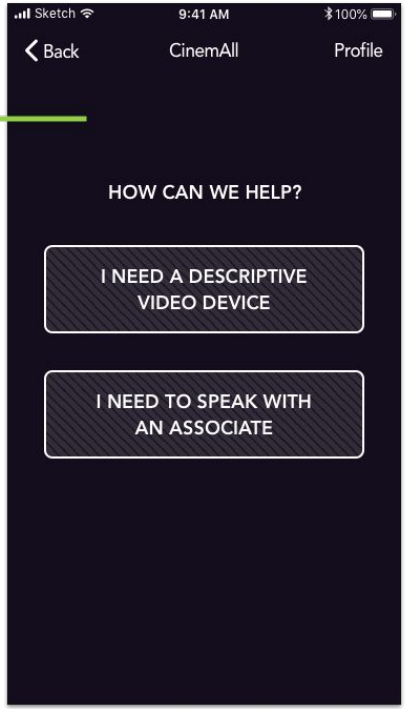
Only necessary audio controls designed

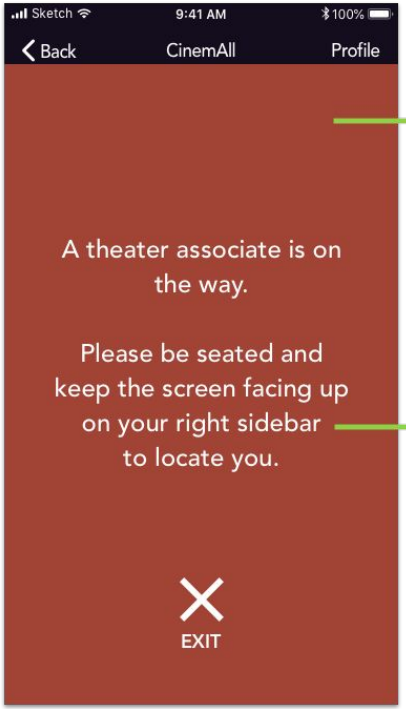
Uniform sized patterned buttons and high contrast through the entire flow

GET HELP (SOLVING FOR AMERICAN THEATERS)

Hi-Fi details

Dark screen with muted colors but with high contrast buttons because this will be used during movie screening and thus needs to have minimal distraction to other patrons





Muted red screen allows theater staff to locate users faster without disrupting other moviegoers.

Clear instructions for the user which will be played in the screen reader audio as well.

PROTOTYPE FOR ACCESSIBILITY

I created the high fidelity prototype in JustinMind

Mimicked screen-reader functionality using different events on touch interactions

Recreacted the prototype in Invision without audio.

Link: https://invis.io/Y4OSLR1QW7R

USABILITY TESTING

Cognitive Walkthroughs with experts

To get detailed analysis of every screen and entire flow from experts at AMAC

9

Evaluation sessions
(2 expert & 7 user test)

Benchmark tasks & System Usability Score

Tasks based on testing audio, sync DV & request help.
Used vision impairment inducing glasses

73

SUS Score

Think Aloud & After Scenario Questionnaire

Questions about ease of completion, time taken and support information available.
Rate on scale of 1-7

4+

ASQ score
(1-5 scale, 5 high usability)

CHALLENGES & FUTURE STEPS

Prioritisation	Initially wanted to control the entire user experience - took on more than what we can chew Focus on quality over quantity ~ learnt to manage time and prioritise
Selecting a concept	Initially had a standstill over which concept to go forward with - each team member preferred their idea Took lead and found the right metric to rank ideas on problem scope and user need
Access to target user group	It was challenging to fit project timelines with target user availability for feedback and user testing. Had to use visual impairment simulation glasses for user testing

Things to do, if we had more time...

Redesign barcode scanning experience	Manual entry was preferred by most users, some used scanning barcode and said it has potential The flow needs to be refined for more intuitive experience
Android app for low cost devices	We left out a section of the target user group due to the personal ios device constraint. Theater management showed interest in the idea and said they would like such a system with android compatibility so they could stock these low cost devices for patrons without mobile phones.

MY CONTRIBUTION

Research	Conducted desktop research and competitive analysis for DV devices Conducted few interviews with both target users & theater staff Watched a movie using DV device at Regal Cinemas Analyzed research data to identify insights
Interaction Design	Participated in Ideation - proposed both Service app and Audio streaming app Designed wireframes for both app ideas- iterated through multiple design critiques with team Created the user flow and helped create the journey map Created wireframe prototypes for initial feedback
Visual Design	Designed high-fidelity screens with one more teammate
Prototyping	Solely created the high-fidelity prototype in JustinMind to mimic voice over feature Re-created in Invision for documentation
Usability Testing	Participated in creating Usability Testing plan Conducted 2 of the tests

THANK YOU

Questions ?

***Our awesome team**: Luna Ouyang, Crista Peet & Danielle S*