Talk-a-Palooza

An AI-powered app to boost children's language acquisition

Featuring our mentors:

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The Problem

5-10% of preschool-aged children experiencing speech delays

+

Long Speech Therapy Waitlists

=

Significant impact on a child's language progress

The Solution

Use data-driven approach to analyse children speech levels, and help them talk even better with **fun** games and **predictions**

How does it work?

01

Assess the
Child’s language level

02

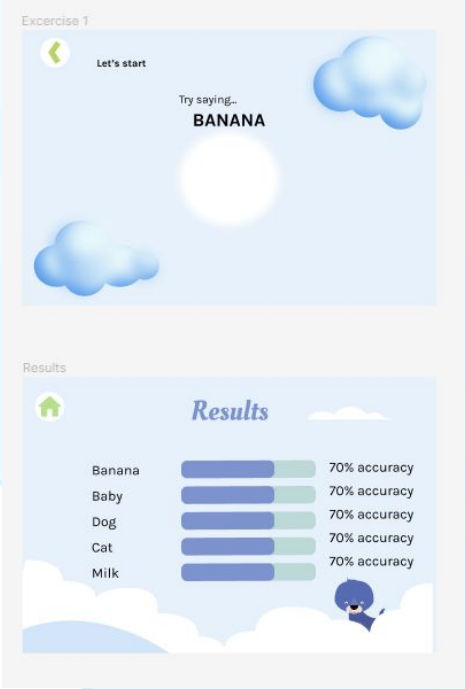
Add some fun

03

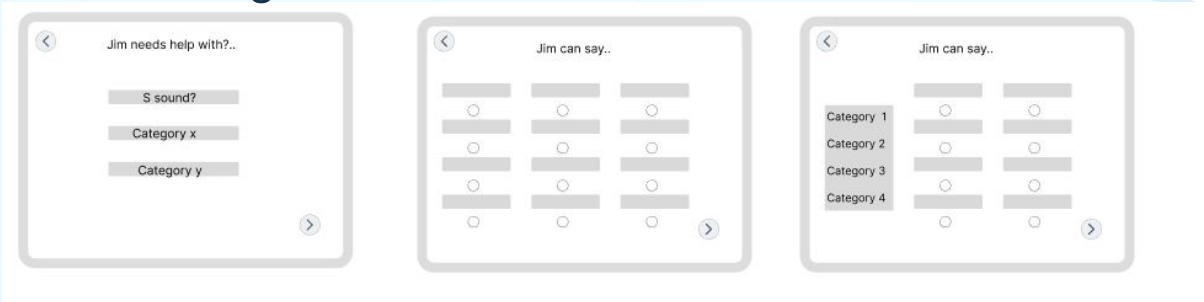
Analyse and track

How UX envisioned the app

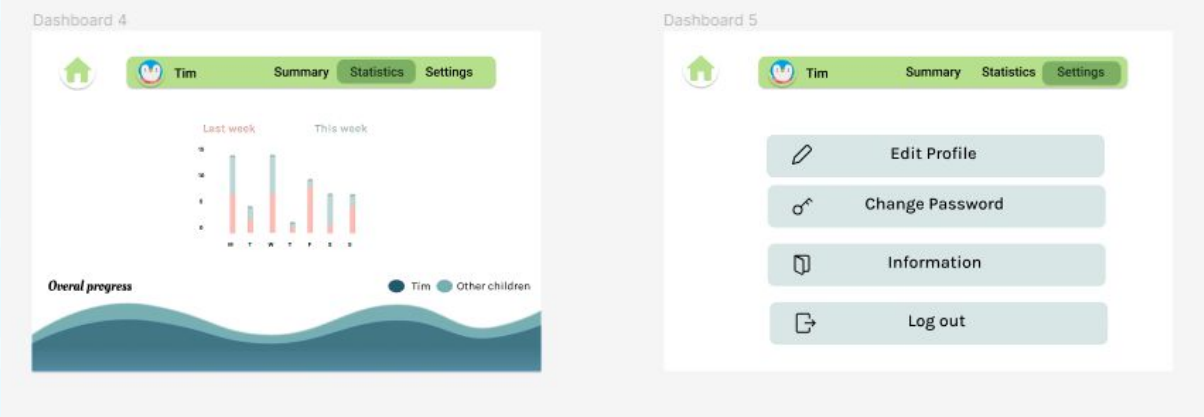
Children area



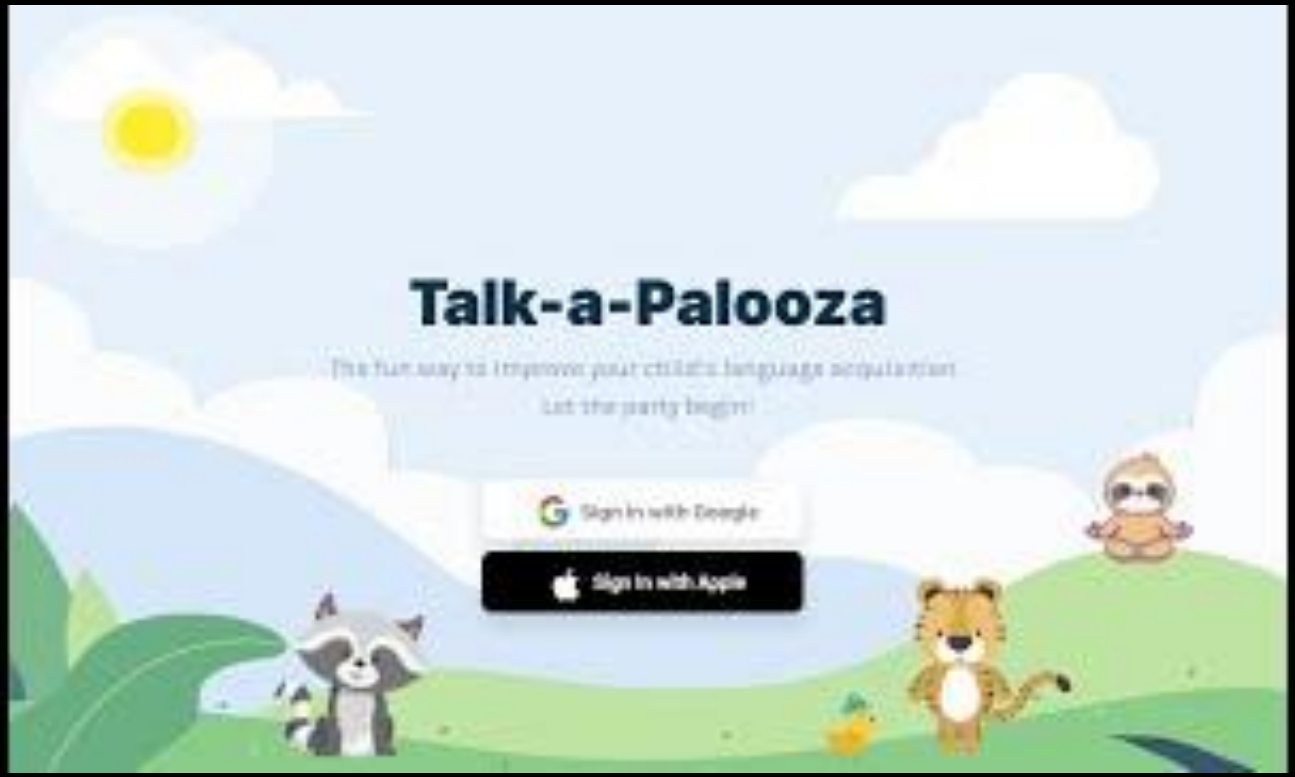
Brainstorming for Initial Assessment



Adults' area.



Chapter I: Initial Assessment



Behind the Scenes

User demographics

Personalized assessment tests

Hybrid-based collaborative filtering model **(LightGCN)**; trained on the Wordbank dataset

List of personalized recommendations

Chapter II: Audio Exercise

Behind the Scenes:

FastAI

Leverage and compare **pretrained** models for quick and dirty **first prototype**

Take advantage of learner class' **predict** method outputs to compare tensors and create an intelligibility rating

API

transform to image data

Audio recordings for 477 of words proposed by DS, many **singular recordings,** however

Dataset issues

PyTorch

use audio data directly

Customised **CNN architecture** applying various audio **transformations to the audio data directly** before putting it through a CNN with four convolutional layers, outputting **53 classes**

Chapter III: Dashboard

Behind the Scenes

- ✔ Built with Expo React Native
- ✔ UI Framework: Tailwind CSS
- ✔ 26 components for 5 screens
- ✔ Handling Front End & Backend

API connections to **2** python server

12 API endpoints

- ✔ Built with express and mongoDB Atlas
- ✔ **5 DB models** for : User | child | recording | vocabulary logs | wordBank
- ✔ User authentication endpoints (oAuth)
- ✔ Complex conditional Routes rendering

Vision

	Project Phase	Vision	
Medium	✔ **MERN App, Github Repo**	PWA, Hosted	**Tablet & Mobile App**
Speech Recognition	✔ **Word Recognition & Score**	Training Data Audio Augmentation	**More Robust Training Data**
Personalization & predictions	✔ **Predictions based on available datasets**	AI-driven initial assessment test	Trainable Spaced Repetition Model
Progress Tracking	✔ **word production count**	**Semantic and phonological networks stats**	**Full report shareable with speech professionals.**
Gamification	✔ **Video**	Collectible pictures	**Nursery rhymes, games, short stories, Video face masks filters.**

Retrospective

Achievements

Learning more about the work of different tracks

Managed to produce a MVP with only half of the team

Gained knowledge beyond the program's core curriculum

Most of MVP Goals achieved, although a lot of parallel work between teams and learning at the same time

Challenges

Initial communication gaps between tracks

Finding data

Loss of team members almost 1 month in

Time management

Thank you!

Please feel free to ask any questions. 😄

By Talk a Palooza team, for Techlabs Berlin, SS23