# ARD

# The Problem Domain

In the world of music education and cultural heritage, there is a growing demand for personalized tools to enhance singing abilities, especially for individuals preparing for significant cultural milestones like a Bar Mitzvah. Our project's problem domain centers around developing an application that serves as a dedicated solution for Rabbi-led vocal instruction, guiding young learners in reading from the Torah during their Bar Mitzvah preparations.

The primary focus remains on helping users to practice and enhance their singing capabilities through interactive methods. The app enables users to select songs and voice samples for personalized practice sessions, aligning with the requirements of Torah reading. Real-time feedback, analysis, and visualization features are designed to improve pitch accuracy, timing, and overall vocal expression.

# Context

Our system operates in the world of tuning and voice coaching with focus on Torah reading and improving. We want our users to have access to a learning app that helps them practice voice and tuning in the most comfortable way that we can provide. Our system will work in the following manner:  
תמונה שמכילה תרשים, טקסט, שרטוט, קו

התיאור נוצר באופן אוטומטי

# Vision

With our app we aim to give users the ability to express themselves confidently and skillfully through singing. Our app aims to improve vocal learning with personalized guidance and real-time feedback, creating a fun and engaging experience for users.

## The main goals for our app are:

**Personalized Learning:** Voice Coach allows users to pick or upload songs for a personalized learning experience. The app actively listens in real-time, offering instant feedback on tuning and voice changes.

**Real-time Improvement:** Guiding users on how to improve as they sing, Voice Coach ensures they sound as close as possible to the original sample, fostering continuous progress and confidence.

**Comprehensive Analysis:** After each session, Voice Coach provides a detailed analysis, including graphs and charts, along with a score reflecting the user's performance and growth over time.

**User-Centric Features:** Registration enables users to track voice projects and improvements. With a selection of songs or voice samples, users can choose from a range of options to learn and improve upon.

**Rabbi's Teaching Torah:** Voice Coach extends beyond individual singing lessons to help Rabbi teaching Torah to students.

Functional Requirements

# 1. User Registration and Profile Management:

* Users should be able to create accounts to access personalized features.
* Profile management functionality should allow users to update personal information, track progress, and manage preferences.

# 2. Song/Voice Sample Selection:

* Users should be able to choose from a variety of songs or upload their own voice samples for practice.
* The app should support a diverse range of musical genres and difficulty levels.

# 3. Real-time Audio Feedback:

* The app should provide real-time feedback on the user's singing performance.
* Feedback should include pitch accuracy, timing, and other relevant metrics.

# 4. Voice Comparison and Analysis:

* Users should be able to compare their singing to the original voice sample.
* Detailed analysis should be provided, highlighting areas for improvement in pitch, tone, and rhythm.

# 5. Visualization of Performance:

* Graphs and charts should be generated to visually represent the user's performance throughout the song.
* Visual feedback can include pitch graphs, waveform comparisons, and other relevant metrics.

# 6. Scoring and Progress Tracking:

* The app should assign scores to the user's performance based on various criteria.
* Progress tracking features should allow users to see improvements over time.

# 7. Customization of Practice Sessions:

* Users should be able to customize practice sessions, adjusting playback speed, pitch, and difficulty.
* Customization options should cater to users of different skill levels.

# 8. Voice Project Library:

* A library of songs or voice samples should be available for users to choose from.
* Regular updates to the library can keep content fresh and engaging.

# 9. User Community and Social Features:

* Users should have the option to share their achievements and progress with a community of fellow singers.
* Social features like comments, likes, and sharing can enhance user engagement.

# 10. Data Security and Privacy:

* Ensure that user data, especially voice recordings, is stored securely and adheres to privacy regulations.
* Implement secure authentication mechanisms to protect user accounts and sensitive information.