

The Music Assistant

Spring Project Plan • January 22, 2019

A scenic view of the Florida Tech campus. In the foreground, there's a pond with a fountain in the center. To the right, a large, modern building with a white dome and brickwork is visible, surrounded by green lawns and trees. The sky is clear and blue.

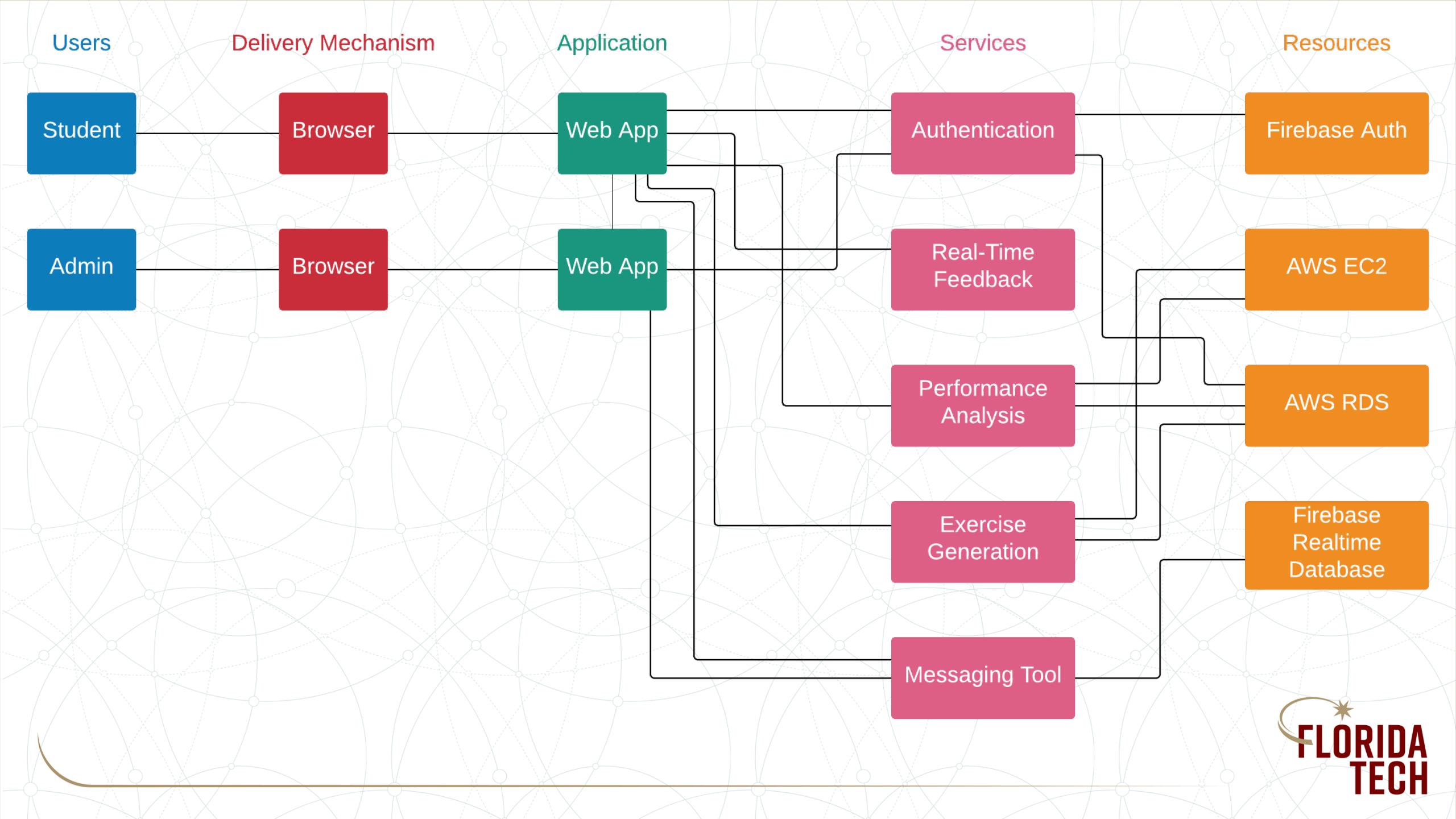
Goal & Motivation

The Goal

- Help students learn sheet music and improve their singing ability
- Real-time feedback
- Dynamic exercises

Our Motivation

- Many choir members either don't practice, don't know how to practice, or don't practice correctly
- Reasons include lack of training, discipline or self-confidence
- Current applications rely on a set series of exercises and abstract away the actual sheet music



Core Features

Core Features for Students

1. Real-time feedback (via a web app)
2. Dynamic exercises
3. Statistical analysis
4. Integrated communication tool

Core Features for Teachers

1. Statistical analyses for the choir
2. Integrated communication tool

A scenic view of Florida Tech's campus. In the foreground, a large pond reflects the surrounding buildings and trees. A fountain is visible in the center of the pond. To the right, a prominent building with a white dome and brickwork is visible, surrounded by green lawns and palm trees. The sky is clear and blue.

Technical Challenges

Efficiency (Space & Time)

- Encode sheet music data to store on the database
- Provide dynamic exercises in a timely manner

Performance

- Providing real-time feedback is CPU intensive
- Websites can struggle to use a computer's full processing potential
- Optimizations have been made
- Use dev tools to determine bottleneck

Database & Server

- No group members have set up a database or server before
- Using AWS RDS and EC2
- RDS is running MySQL
- EC2 VM is running Node.js

Evaluation

Evaluation

- Accuracy
 - Does the program accurately measure performance?
 - Test the program with a control file to measure accuracy
- Effectiveness
 - Does the program improve students' performance?
 - Measure performance at the start and end of the semester
- Feedback
 - What did the students and teacher think of the program?

A scenic view of Florida Tech's campus. In the foreground, a calm lake reflects the surrounding buildings and trees. A fountain is visible in the center of the lake. To the right, a large, modern brick building with a prominent white dome on top stands behind some greenery. The sky is clear and blue. The overall atmosphere is peaceful and academic.

Progress Summary

Module/feature	Completion %	To do
Create Web App Template and Host on Firebase	100%	None.
Real-Time Feedback w/ AlphaTab and P5	85%	Fix performance problems. Load AlphaTab only when needed. Fix AlphaTab bugs.
Authentication	80%	Finish coding sign up flow and sign in flow.
Create MySQL Database and Upload to AWS RDS.	50%	Code database design and add database to AWS RDS.
Encapsulate provided sheet music and real-time performance for analysis	75%	Encapsulate student performance to compare against stored sheet music
Integrated communication tool	0%	Set up real-time database, design front end app, design back end app
Display sheet music with configurations	75%	Include custom settings page and options

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Milestone Plans

Milestone 4 Tasks

Feb 17

- Implement, test, and demo sign in and sign up flow working from the frontend to the backend.
- Implement, test, and demo adding sheet music and related initialization data.
- Implement, test, and demo the flow from performing to receiving exercises.
- Implement, test, and demo all of the customization settings for AlphaTab through the website.

Milestone 5 Tasks

Mar 23

- Implement, test, and demo setting up a class and overseeing students.
- Implement, test, and demo user results
- Evaluation results
- Create poster for Senior Design Showcase

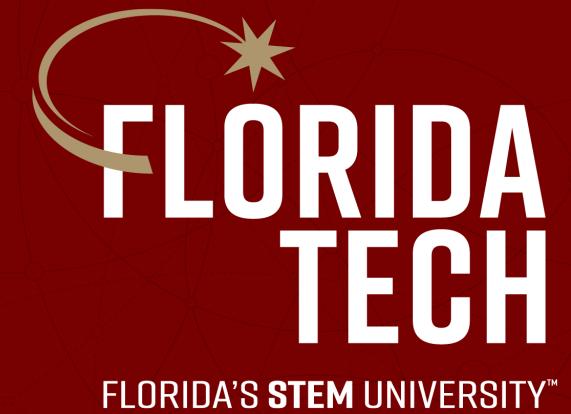
Milestone 6 Tasks

Apr 24

- Implement, test, and demo the messaging service.
- Test/demo of the entire system
- Evaluation results
- Create user manual
- Create demo video

Milestone 4 Task Matrix

Task	Daniel Griessler	Daniel Levy	Javier Munoz
Authentication	0%	100%	0%
Set up AWS RDS w/ MySQL	0%	100%	0%
AlphaTab Customizations	30%	70%	0%
Flow from performance to exercises	65%	10%	50%
Verify Accuracy of Analysis	0%	0%	100%
Generate Exercise based off Analysis	0%	0%	100%



Questions?

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