

Musical Education Application

Software Requirements Specification
CSCE 247: Software Engineering

“404: Not Found”

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1. Introduction

Purpose

The Musical Education application provides an easily accessible entry point to the journey of music education for users of all ages. Instruments can be large investments, take up considerable space, and are often not easily portable, while Musical Education can be installed for free on any mobile phone that fits in your pocket and can be taken anywhere. Digitizing music learning also enables conveniences not possible in their analog counterparts, such as sound being carried through headphones rather than disrupting those around you. The availability of built-in music libraries and a synced visual display of sheet music will allow for an optimized and consolidated learning experience, instead of requiring users to buy or search for music tracks and sheet music one-by-one, which they still may do if they choose. Musical Education will serve as the safest gateway to music for casual and dedicated users alike, and its convenience and versatility will continue to serve even the users who choose to purchase an instrument.

2. Stakeholders

- Educators
- Hobbyists
- Professional musicians

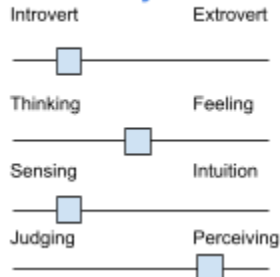
Lucian Simons

Age: 13
Hometown: Columbia, SC
Education: Middle school student
Work: Freelance digital artist
Character: Emotive



Bio: Lucian is a typical middle schooler from South Carolina. He enjoys learning on his own but finds school uninteresting. In his free time, he enjoys gaming, which greatly influences his musical tastes.

Personality:



Motivation:



Goals: Lucian wants to develop sight reading skills that will enable him to tackle sheet music for songs he's interested in. Additionally, he improves his technique, explore the arrangements of his favorite songs, understand the fundamentals of harmony.

Frustrations: Lucian struggles with bearing through the tedium typically associated with music education. At the same time, he doesn't want to be condescended to, which might place a lower limit on how much the beginning stages of his musical education can be simplified.

Technological literacy: As he mostly uses mobile devices, he has limited experience with file systems and formats. However, he is very comfortable with the streamlined environment provided by modern apps.

Brands and Influencers:



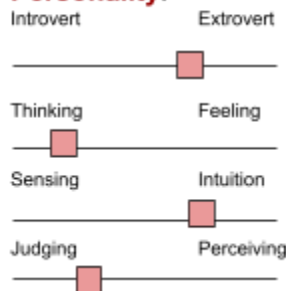
Gertrude Godowsky

Age: 68
Hometown: Orlando, Florida
Work: Retired
Character: Aesthete



Bio: Gertrude took piano lessons as a child, but she abandoned the instrument as the responsibilities of adulthood took up increasingly large amounts of her time. She continued to greatly enjoy music as a listener, developing refined taste. In retirement, she seeks to rekindle her relationship with music.

Personality:



Motivation:



Goals: Gertrude wants to learn songs she enjoyed in her youth, demonstrate skills to her friends, and use music education for relaxation.

Frustrations: Having meager technological skills, Gertrude reacts poorly to the complexities of most software. Additionally, she isn't interested in recent music, preferring the experimental music of the 70s'.

Technological literacy: Her experience with technology is very limited. She is comfortable using her phone to keep up with friends, surf the web and play simple mobile games.


Brands and Influencers:







John Myers

Age: 39
Hometown: Atlanta, GA
Work: Middle school teacher
Character: Leader






Bio: John Myers was born and raised in Atlanta, where he is currently a public school music teacher. His job requires him to address the needs of underprivileged students.



Personality:

Introvert	Extrovert
	
Thinking	Feeling
	
Sensing	Intuition
	
Judging	Perceiving
	

Motivation:



Incentive	
Fear	
Growth	
Power	
Social	



Goals: Myers wants an educational software that will make it easier to teach music to his kids. Ideally, this software would be easy for students to access outside of the classroom as well.

Frustrations: He dislikes software that paywalls essential features. He also objects to educational programs that have a steep learning curve.

Technological literacy: He is experienced in a wide range of music software and is comfortable with navigating file systems.

Brands and Influencers:

The Royal Conservatory
The finest instrument is the mind.

3. Constraints

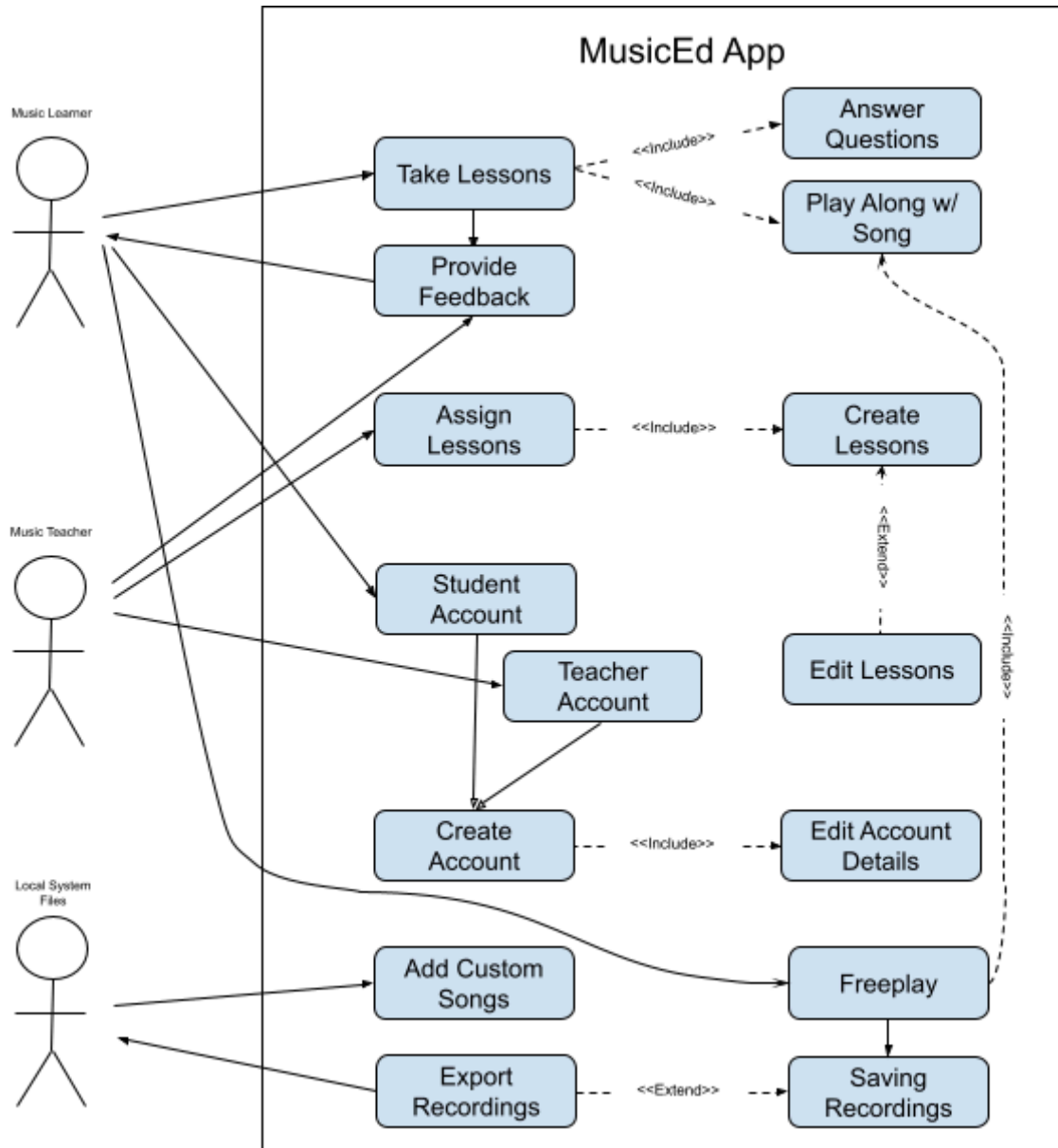
The major constraint for the Musical Education project is the work schedule for development; Each of the four developers have different schedules and cannot meet often outside of class on weekdays. Most work will be done asynchronously and split up so that only one person will be working on any given section, rather than everyone working together on every section; the inevitable result is imperfection, however the alternative is incompleteness. Another major constraint related to time is the one-semester time limit for the completion of the project, not to mention the individual weekly due dates of various aspects of the project. This imposes a restriction on the breadth of the project, which may result in planned features being cut.

4. Overall Description

This app will be accessible via a mobile device, and it will allow users to download music in the form of MIDI files from open source databases. It will interact with the device's built-in audio equipment to play these files for the user. For the purpose of educating the user in their chosen instrument, visual music notation (e.g. sheet music, tablature) will

accompany music playback. Convenience features like looping playback, pausing, track muting/hiding will further facilitate the learning process.

5. Business Use Cases



6. Functional Requirements

 Requirements Doc

7. Non-Functional Requirements

User Interface Requirements:

- The user interface shall be easy to understand
- The user interface shall be accessible to a wide range of users

Compatibility Requirements:

- The user shall be able to use the software in both portrait and landscape modes.
- The software shall be able to run on a variety of mobile devices.

Security Requirements:

- All of the user's information shall be stored in a secure manner
- The software shall notify the user of good security practices (i.e. changing passwords regularly)

Legal Requirements:

- The software shall comply with all local and federal law.
- The software shall not violate copyright.

9. Competitive Analysis

	Simply Piano
Strengths	<p>Questionnaire and profile creation helps find user's level of experience playing piano, the user's goals for piano-playing and what equipment they already have.</p> <p>Colorful and inviting design. Simple, large menus and side scrolling make app navigation easy for everyone using the app whether you have used an app before or not.</p> <p>Automatically plays videos in order at a pace easy to follow. All video options such as pause and repeat are shown and user is asked at the end of the video to rewatch or not.</p> <p>Interactive play along lessons with sheet music that listen to what you play and adjust the lesson accordingly.</p>
Weaknesses	<p>Expensive monthly payment.</p> <p>Song Library is locked as premium content.</p> <p>Anything past the first basic lesson is premium content, meaning that you must pay \$25 a month to use any of the app's features.</p> <p>Different apps for each instrument, meaning to learn both piano and guitar you would need to download two separate apps.</p> <p>No website version, only app.</p>
Audience/ Focus	<p>Simply Piano was created for a wide array of ages split into two main categories which are kids 4-10 and adults from 11-99.</p> <p>The aim of the app is to introduce beginners into how to play piano and to encourage consistent practice for those who do play piano by providing features such as play-along and active listening to assist in the ease of learning piano.</p>

	Yousician
Strengths	<p>Lengthy questionnaire helps identify user experience, equipment and goals.</p> <p>Yousician has three instruments in the app, guitar, bass and singing which do not need another app to implement and use.</p> <p>Very crisp and cohesive design lends itself well to navigation and use. Utilizes the landscape orientation extremely well with main menus along the top, sub menus below and main content along the bottom.</p> <p>Well structured levels with multiple chapters and then multiple lessons in each chapter for a lot of content that include play along music that listens and corrects in real-time.</p> <p>Great tuning application that can be used for multiple instruments and purposeful alternative tuning.</p> <p>Lengthy profile section with badges, streaks, statistics and followers/following.</p> <p>Has a website version where you access your account and content from a browser.</p>
Weaknesses	<p>A massive amount of the app is behind the premium paywall which costs \$12 a month including any lesson except the basics, the song/library for all music and sheet music and the workouts and courses tabs.</p> <p>You cannot learn piano or ukelele in the app, you have to follow a link and get separate apps for those instruments which means more paywalls and less storage on your device.</p>
Audience/ Focus	<p>The audience for Yousician is anyone looking to learn how to play guitar or already knows how and is looking to improve. there is not a kids version so kids can use the app if they can use the regular app, but there is no version with easier lessons and content for kids.</p> <p>The app's focus is incremental skill learning for your instrument of choice where they introduce a skill, practice for the skill and then a song or music to implement your new skill.</p>

	Ultimate Guitar
Strengths	<p>Can use either portrait or landscape orientation which both serve different purposes for different sections of the app.</p> <p>Both web and application versions allowing easy access from whatever device.</p> <p>Humungous library of sheet music that is available for free which includes multiple different versions of tens of thousands of songs.</p> <p>Can create playlists of artists, songs or sheet music for free that you can see under your account to help sort the content you want to access regularly.</p> <p>You can publish your own sheet music for songs on the website or app, allowing users to create music that is free and readily available. This means there is a much wider range of music being uploaded for the Ultimate Guitar team does not have to write and publish it</p> <p>Can connect your spotify account to easily access the music you listen to in the website or app which makes finding music you want to play incredibly easy.</p> <p>Articles and forum tabs to talk, read and connect with the guitar community.</p>
Weaknesses	<p>Paywall for any courses and songbooks, making it expensive to start a learning journey solely through this app.</p> <p>Lots of ads for that is how they keep so much content free and not stuck behind a paywall.</p> <p>No play along content, simply lesson videos and sheet music so you will not get any real time feedback on your playing.</p>
Audience/ Focus	<p>The audience is anyone who plays guitar, not necessarily for those looking to learn but for those looking for supplemental resources such as sheet music and advice from other players.</p> <p>The focus is mainly on the sheet music sharing. Ultimate Guitar is the destination for free guitar sheet music and it is clear this is their main focus and goal.</p>

Summary

	Strengths	Weaknesses	Focus
Simply Piano	+Multiple profiles +Simple, easy-to-use design +Play along lessons	-Expensive paywall -Seperate apps for separate instruments -No website version	Learning piano through play along lessons and songs
Yousician	+Tons of content +Play along lessons +Detailed profile statistics	-Expensive Paywall -Seperate apps for separate instruments	Learning many instruments through structured lessons and play along music
Ultimate Guitar	+Massive free music catalog +User to User interaction +Playlist creation +Spotify connectivity +Video shorts tab	-No play-along lessons -Ads -Some content behind paywalls	Creation and sharing of free guitar sheet/chord music

Reading up and interacting with the three applications Simply Piano, Yousician and Ultimate Guitar have given us a strong sense of what users are looking for in a music learning app. Through the analysis displayed in this section, we have arrived at several decisions about the app design. What users are looking for in these apps is a way to learn a popular instrument such as piano, guitar or even singing through structured lessons. They would also like it to be free or at the very least, less than ten dollars a month.

From this we have come to certain conclusions about our app. Our application should feature some manner of play-along and hopefully include a listening feature to provide users with real time feedback on their playing. Our application should primarily be designed in landscape orientation for we found many users prefer this when using other popular applications but to stand out, it would be smart to implement a way to use portrait mode as well to give users the choice. There should also be a wide array of songs to choose to learn from in a library or catalog so that users can not only learn the skills, but be able to see their practice pay off by being able to play songs they enjoy.