

# Phase II: Refined Product Proposal

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**Project Concept:** Automatic sheet music / guitar tablature generator (mobile application)

## **Project Description:**

Convert audio data read from a smartphone's microphone into readable sheet music or guitar tablature so that you don't lose any progress in the music creation process. The idea was born from every musician ever. The creative process of writing music requires documenting new ideas that can come on the spur of the moment at the most inopportune times. Unfortunately, this means that many great song beginnings have died before they could get off the ground because a melody or riff can be so fleeting that it can be forgotten faster than it was created. This mobile application aims at defeating creativity loss due to forgetfulness and bad timing. By creating a simple, mobile tool for documenting musical inspiration, this app will aid the creative process of writing music

## **Stakeholders:**

- User:
  - Home and amateur musicians
  - Potentially professional musicians and/or sound engineers
  - **Requirements:**
    - *Portability*- Makes for flexibility in recording on the go
    - *Cross-Platform Flexibility*- Anybody with a smartphone should have access regardless of OS
    - *Low Price Tag*- Many other Audio Recording peripherals cost enough as it is and affordability expands the consumer base to anyone with an interest in the software
    - *Accurate Execution*- Does not need to hit every note but accurate enough to capture the essence of the incoming audio
  
- Client
  - Digital Audio Processing Software Developers i.e. Cakewalk/protocols
  - **Requirements:**
    - Product should be easily integrated into existing software as a plugin
    - The accuracy must be strong enough to market as a professional tool
    - Offer differing functionality for a amateur vs. professional version of the tool
  
- Designer:
  - Student group
  - **Requirements:**
    - Target an amateur and professional crowd
    - Should be able to be realized within a year
    - Should not cost a lot to make, low budget with high reward

### **Practicality:**

- Almost entirely software-based if smartphones are the sole source of microphone input and no focus is put on creating an alternate external peripheral
- Requires some extensive musical knowledge and input in addition to programming expertise so that the results can be verified
- Will require working with several existing libraries as far as pitch-matching is concerned
- Mapping the recognized pitch to a scale or guitar tab is the most software-intensive aspect as it will likely require starting from scratch
- The project can be extended or scaled down based on team size, more programmers could open up the possibility of extending into online sharing and other features that would probably be left out in the case of a smaller working team
- Overall, the project is definitely feasible within a 1 year time frame if several dedicated software writers can support the project.

### • **Required Skills:**

- *Software Expertise*
  - Mobile programming- initially programming on Android but with the possibility of making the software available to all mobile OSes for ease of access
- *Music Expertise*
  - Ability to read music, some basic pitch recognition, ability to QA the application along the way to verify correctness in pitch detection / mapping to a scale
- *Audio Processing Expertise*
  - Working with audio processing libraries for pitch-recognition and mapping to a scale

### **SWOT analysis:**

- *Strengths*
  - New idea, not much software of the kind out there especially on the mobile smartphone market.
  - Universal use between amateurs and professionals if it can be successfully incorporated into existing audio processing software on the market
  - Ease of access, the universality of mobile phones makes it an easy to access app for anybody with anything above a flip phone
  - Definite need for an app of this kind, not just a cool concept but one that people would readily shell out some money for
- *Weaknesses*

- Overly complex. Working with audio processing for multiple pitch recognition might be challenging depending on tempo and the number of simultaneous notes. Might be difficult to make it functional and keep up with a professional guitarist / pianist etc.
- Not using the best sensors. Smartphone microphones are good for portability's sake, but the tradeoff is in their quality and this could compromise the premise of the project.
- *Opportunities*
  - Expand into already commercial audio software
  - Start at an amateur musician level and expand based on the success of the original application
  - Could create an "open source" community in songwriting where amateur songwriters share musical notation online and foster the creation of new music
- *Threats*
  - While not overly developed on the market, it could be released while we are in our own developmental process
  - The limitations of smartphone hardware and software could pose another roadblock as far as the project is concerned. Some more research is required to check on any available libraries that could be incorporated into the project