Patrick Tofield - November 3, 2016

ListenUP - Product Vision

Game Concept

ListenUP is an educational software game in which users (students) are trained to listen to, and identify the various instruments in a piece of music. They are given a number of pre-recorded music tracks (“Master Tracks”) to choose from and a library of solo instruments, organized by type. Each instrument type has a collection of pre-recorded solo parts or tracks to choose from (“Instrument Tracks”). The objective is to identify the correct individual instruments and tracks that make-up the chosen piece of music, then ‘mix’ them in an audio mixing console so that the mixed piece resembles the original as closely as possible.

The game will be created in Unity3D and distributed as a stand-alone application.

Game Elements

Master Track

The Master Track is a short piece of pre-recorded, instrumental music that plays in a loop. It consists of a number of instruments and the objective is to listen to this track and try to pick-out the individual instruments that make up the track. A collection of Master Tracks are accessible from the Master Track Library. Once a Master Track is chosen, it is added to the Mixer and can be controlled by the Play, Pause and Stop buttons, and the volume can be adjusted by the Master Track Fader.

Instrument Track

The Instrument Tracks are recordings of individual instruments, each playing a line of music. One of these Instrument Tracks will be playing the part used in the currently selected Master Track for that instrument. The Instrument Tracks are collected in the Instrument Track Library which is organized into instrument types….drums, guitars, keyboards etc. Once a Instrument Track is chosen, it is added to the Mixer as an individual Channel and can be controlled by the Play, Pause and Stop buttons, and the volume and pan can be adjusted by the Instrument Track Fader.

Mixer

The mixer is a simplified version of an audio console typical of sound recording studios. Instrument tracks or channels can be controlled by volume ‘faders’ and the sound can be panned to the left or right in the stereo space.

In ListenUP, the Mixer is where the user will mix the Instrument Tracks and attempt to match the instrumentation, volume and pan that they identified in the Master Track.

The Instrument Track faders control the volume and pan of individual Instrument Tracks. The overall volume for Instrument Tracks can be controlled as a group via the Stereo Mix Fader. The volume of the Master Track is controlled by the Master Track Fader.

Playback for all tracks is controlled via the playback controls - Play, Pause and Stop and volume meters show the overall volume for the tracks currently playing.

Master Track Library

The Master Track Library contains a collection of Master Tracks, organized into music type categories.

The user selects a category by clicking on the category image - the Master Tracks associated with that category are displayed. Each track is a different, pre-recorded piece of music that suits the style of the currently selected category.

Clicking on a track gives an audio preview of that track. Double-clicking will add that track to the mixer, where it will be controlled by the Play, Pause and Stop buttons and the volume is controlled by the Master Track faders.

Instrument Track Library

The Instrument Track Library contains a collection of individual instrument tracks, organized by instrument type.

The user selects an instrument type by clicking on the category image for the instrument. The individual instrument tracks associated with that type are displayed. One of these tracks will be the correct line used in the currently selected Master Track.

Clicking on a track gives an audio preview of that track. Double-clicking will add that track to a new Instrument Channel in the mixer, where the channel volume and pan can be set.

Favorites List

When previewing a Instrument Track, the user can mark a track as being a possible candidate for the correct track in the Master Track. These ‘starred’ tracks are then added to the Favorites List which is accessible through the main menu in the Instrument Track Library.Previewing the tracks in the Favorites List and adding to the mixer is the same as described above in the The Instrument Track Library.

Assessment (ListenUP mode - see Modes of Play)

The Assessment section displays final user mixes, submitted from the Mixer. The mix is saved and the teacher or mentor receives notification and a link to access the mix, together with the original Master Track for comparison. The teacher will be able to give a grade and assessment of the mix and submit that back to the user. Once graded, the grade and assessment will appear in the user’s Assessment section of the game.

Modes of Play

The game has two modes of play:

1. **Basic Mix Mode**: In this mode the mixer has a similar functionality to a traditional audio mixer and is played without the Master Track or Assessment features. Just add some Instrument Tracks, mix and make an awesome new track! *

   In this mode the Instrument Track Library tracks can also be filtered by tempo (bpm) to enable the user to select from tracks that will play at the same tempo. The Master Track Library is inactive in this mode and a Master Track cannot be added to the Mixer. This mode is played for fun, although a lot can be learnt from the basic function of mixing sounds and music.

   *User-created mixes can be added to a User Track Library (future version) and shared with other users of the game, however, these tracks cannot be edited by others and do not appear in the Master Track Library.

2. **ListenUP Mode**. This is the mode of play that was described earlier in this document. Users are required to choose a Master Track and then select the correct instruments and tracks for the piece. Finally mixing and comparing to see how close they can get to the chosen Master Track.

   In this mode, the Assessment can be submitted to the Assessment section, where it will be available to the the student's teacher or mentor for assessment.

Target Audience & Learning Objectives

Although the game can be played and enjoyed by anyone with an interest in music and recorded sound, the game would be suitable as a learning tool for the following user types:

1. **Elementary school students** as an introduction to music and sound. Students are encouraged to hear the different instruments that make up a piece of music and experiment / play with creating their own tracks.

   Users in this demographic would possibly benefit most from playing in the Basic Mix Mode where they would learn:
   - “Hearing music” - identifying styles of music and basic structure
   - Types of instruments
   - Pitch and dynamic range (volume) of instruments - how instruments sound together
   - Harmony - how musical phrases sound together
   - Tempo and rhythm

2. **Secondary / High school students** as a component within the study of music and sound. Students are trained to listen to and appreciate the structure of recorded music.

   Users in this demographic would benefit from preliminary exercises in the Basic Mix Mode to gain an appreciation of the concept of instrumentation and sound placement, moving on to the ListenUP mode for more advanced work and assessment of their own attempts to re-create a Master Track.

   In addition to the learning objectives outlined above for elementary school students, working in both Basic Mix and ListenUP modes would advance the student’s skills in the following areas:
   - Structure of music (deconstruction and analysis)
   - Dynamics and harmonic range of instruments
   - Basic concepts of sound technology & recording.
   - Basic concepts of recorded sound:
     - Soundscape
     - Dynamics and volume

3. **Students of Sound Engineering**. As a profession, sound engineers are hearing specialists. One of their chief qualities is the ability to hear individual instruments and know where to place them, at appropriate levels, within the music ‘soundscape’. These skills take time and practice to develop to a professional level. This game could be used as an elementary ‘ear-training’ tool for users studying sound engineering, providing a means to develop and sharpen listening skills.

In addition to the learning objectives outlined above for secondary and high school students, working in either mode would advance the student sound engineer's skills in the following areas:

- "Ear training'
- Creating and comparing soundscapes
- Practice basic mixing & balance techniques

Problem Space and Why

Many people listen to and enjoy music on a very surface level. Whilst there is nothing wrong with this, a deeper understanding of the structure, instrumentation and arrangement of recorded music heightens the appreciation of the piece and enhances the ability for critical listening, regardless of the style of music or what instruments are present.

As a musician and ex-sound engineer, the ability to "listen"....really listen, and hear all that's happening in a piece of music, opens-up a whole world beyond the surface of level of the piece. That world is endlessly fascinating for me and is not something that is taught within the current framework of music studies..

Implementation

Technical Implementation:

The game will be designed to play on tablets or desktop computers and preferably using headphones where the user can listen and isolate the music tracks more accurately.

An internet connection will be required for:

- working in ListenUP mode, where assessment submission and grading a user's work is central to the educational value of the game.
- Working in Basic Mix mode where users can create their own mixed tracks and share with other users of the game.

Learning Environment & Methodology

As stated in the Target Audience and Learning Objectives above, the exact implementation will depend on the demographics outlined.

At the Elementary School level, the students would gain most from a more guided usage as part of a broader discussion / teaching of music….followed by play!

Basic Mix Mode would be most appropriate for this age group as stated, and I could see the case for class demonstrations where the teacher guides the class through the game, highlighting the concepts mentioned in the Learning Objectives. This would be followed-up by group or individual exercises where students practice what they were taught through play, and then add their experiments to the User Tracks Library for continued class discussion.

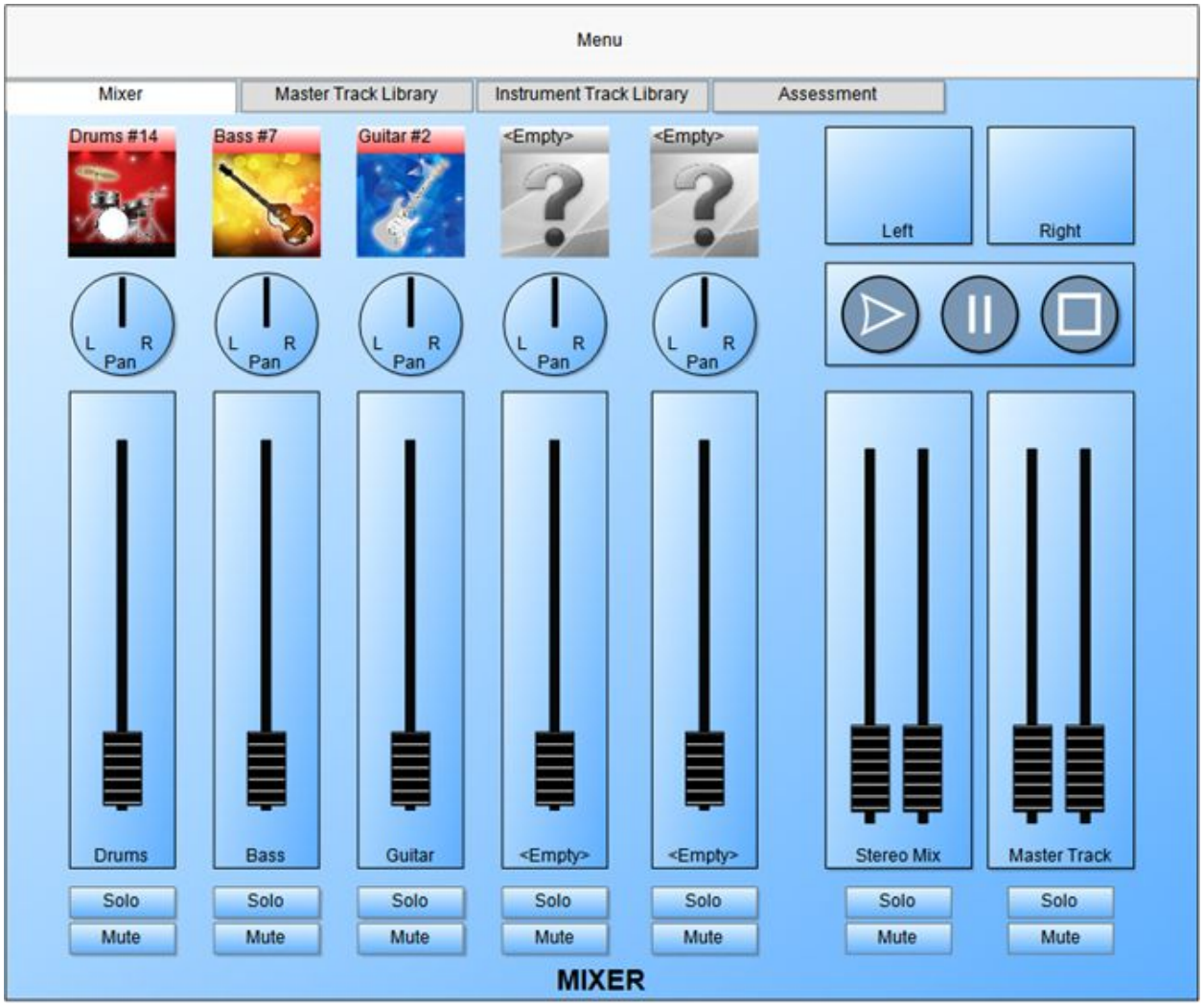
Secondary and high school students would benefit from working in ListenUP mode having played in Basic Mix in class mode to gain an understanding of what's required of them.

For these students, working individually on assignments and submitting assessments as homework would be appropriate. Class discussions, student demonstrations and follow-up mixes could be done following grading.

For the student sound engineer, the game would be played on a more casual, vocational basis, although it could be introduced early in formal studies to give the student a foundation in listening skills.

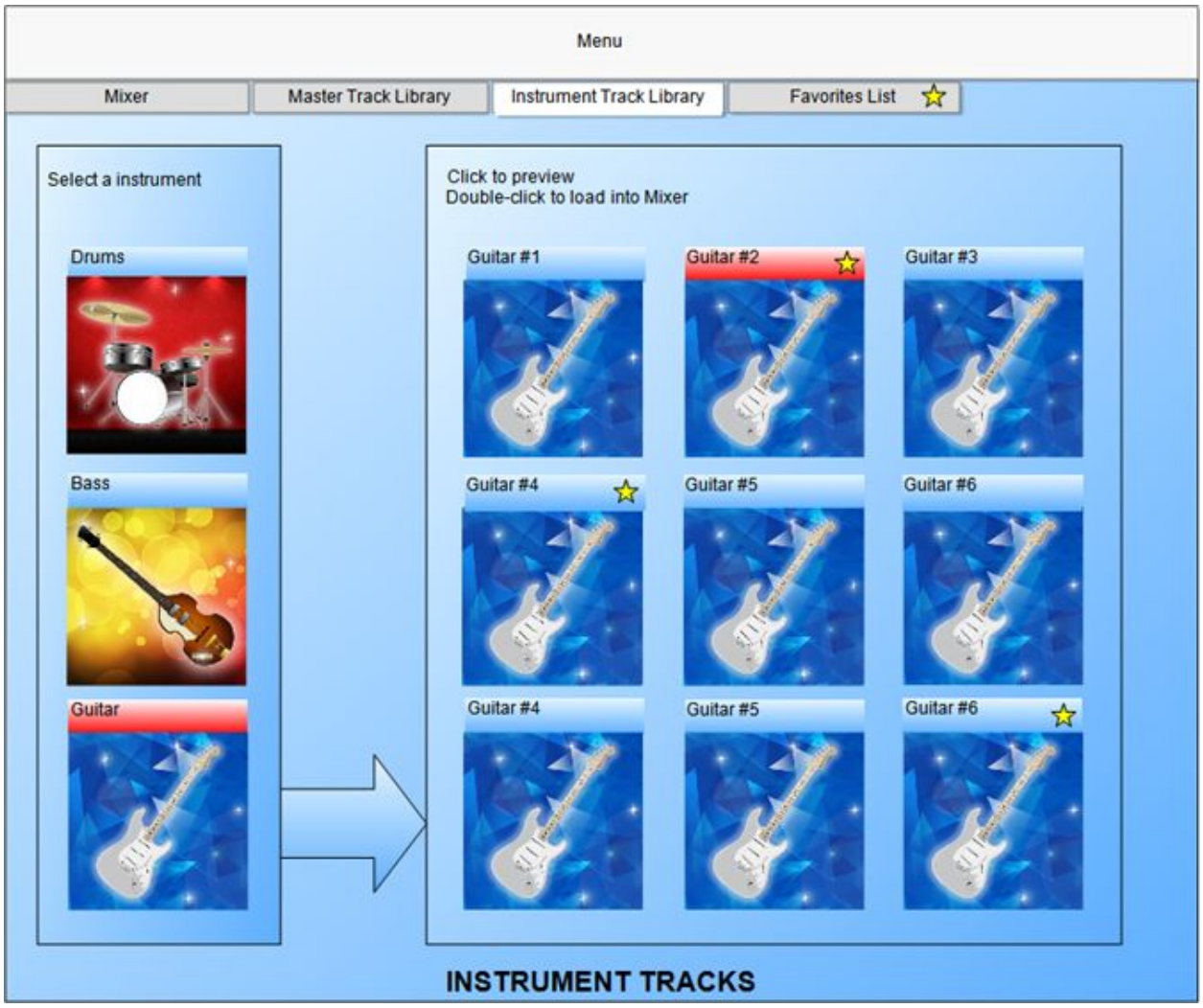
Wireframes

Mixer



Master Track Library

Instrument Track Library



Favorites List

Assessment (ListenUP mode - see Modes of Play)