

Shawn Huntzberry
Capstone Design I
Writing Assignment #3
8 December 2015

The Artificial Instructor

My product, "The Artificial Instructor", brings the knowledge offered from conventional bass lessons into the convenience of a user's home. My software supplies a easy-to-use interface that allows the user to interact with the system and navigate through the features. The system has been developed using the Java programming language, and uses the JavaSound API and the TarsoDSP library in order make user input both easy and accurate. The goal for creating the system was simple, to make access to learning an instrument possible for anyone and everyone. Learning an instrument is not only a great skill to have in the music world but has other benefits outside of that area. Learning anything takes patience, commitment, and determination. My software will both teach the user to play the bass guitar but will also reinforce these other useful skills.

The main requirement for the system to be effective is an accurate way of getting input from the user. Using the JavaSound API, my system makes getting input as easy as plugging the instrument into the computer while the system is running. Using the Mixer data structure my system is able to retrieve the available resources available for both system input and output. After the Mixer is selected the TargetDataLines and SourceDataLines may be created in order to accurately set the input streams and output streams, respectively.

The next major component necessary for the system to effectively simulate a proper instructor is the ability to accurately make sense of the input. Using the TarsoDSP library the system is able to take the data stored, using the TargetDataLines, and translate and offer the system a readable frequency(in Hz), note value, probability of accuracy, and timestamp of the input. With this information I am able to create different algorithms for tuning an instrument, assigning the proper score to a user's attempt, and creating knowledgeable feedback.

The system has been created with a structured lesson plan that teaches the skills necessary in an organized format. To make the process of learning more meaningful, and enjoyable, for the user there has been a scoring system implemented which requires the users to unlock the lessons by receiving a satisfactory score on currently unlocked lessons. When attempting a lesson the user will be assigned a score after completion based on the number of correct notes played, number of incorrect notes played, the correct timing of their strumming,

and the incorrect timing of their strumming. When the lesson is complete the system will produce feedback that is custom to their attempt. The feedback will include a detailed report of the user's attempt, of the expected results, and ways they can improve their attempt in the future. By giving the user this feedback the system not only offers lessons to the user but allows them to understand what they are playing and how they should play it so that they learn from each attempt.

So with the current implementation it is apparent that not only will my system help individuals learn, but it is the most cutting edge product in the industry. Moving forward, we must keep in mind that the system itself will have little maintenance and therefore we can focus on adding new features that not only make the interaction between the user and the system more easy but much more enjoyable. Because we are working with a platform that teaches a skill, the feedback from users will give us any changes that may be helpful to every type of user so we can allow the system to be more customizable by adding different features that users feel may be helpful.

When creating a product it is important that you not only understand who your target audience is and what the opportunity is for the product to survive. The current market for my product is extremely large, and constantly growing. My product is useful, and demanded, by both adults and children who are interested in learning the bass guitar. The Artificial Instructor is also helpful to those who may already know how to play bass guitar but would like to strengthen their knowledge by testing their skills. Finally, it is the type of product that family members and friends can gift to one another as a way to give someone a product that will teach a very productive, creative, and social skill. Finally, we are not just looking to offer a way for users to learn at their home, but my product also offers a way for teachers and instructors to have a platform to assign homework for students. This will allow them to assign lessons to users and be able to check their results and see which points in the lesson they struggled with and excelled in.

Currently, in the market, there is nothing offered to help those trying to learn the bass that does not come with limitations and unpredictable constraints. My software offers those with the desire to learn the ability to choose the hours they want to learn and the pace they would like to learn at, with all the benefits of other methods currently offered. The software provides an easy to use interface that allows the user to focus simply on attempting the lessons to the best of their ability. By only allowing the user to make necessary selections the system helps the user focus on learning the instrument, not learning how to use the software. The scoring system

implemented in my software ensures users progress only when they have mastered topics, this prevents users from “trying to run before they learn to walk”. Additionally, by implementing the scoring system the system allows the users to understand the different areas they can improve in, even if they have received a score that allows them to move to the next lesson.

The market size is enormous. Anybody with access to a computer, an instrument, and the desire to learn is a part of my market. Every day a new child has a birthday and may potentially receive their first instrument. If that instrument is a bass guitar then their parents may be more inclined to also purchase my software in order to help their child learn rather than sending them to expensive private lessons. This occurrence is not restricted to birthdays but also holidays and even just a normal day when someone decides to purchase their first bass guitar. As the music industry grows and people continue to want to become a part of it, the product will increase in demand. Also, as I previously stated, the market is not limited to just people who want to learn the bass but also has benefits for those who already know how to play but want to sharpen their skills.

For the initial launch of my product, full versions of the software will be offered in major chain musical stores and online at our website. If a person is not quite sure if the software is for them, we will also offer free one month trial version of the software that comes with basic functionality and a limited set of lessons. After the trial period is complete the users may upgrade their software on our website or purchase it in store nearest to them. Using this model we expect to make a profit immediately as there is no upkeep required once the software is purchased.

After the initial launch we will be working on improving the interface based on the feedback from users. Improving the interface will not cost anything in materials, only the labor required to implement those changes. As the product gains more traction and the user's complete all of the lessons, we will create and offer new downloadable content that can be purchased through our website and offers new lessons and activities that may be unlocked. This will produce more profit as users complete lessons or want a wider variety of features in their system. With this approach, the profit will continue to increase as the downloadable content not only offers lessons to teach the theory behind learning bass, but also the bass lines from their favorite songs and artists.

To reach the market I am aiming to sell to I will utilize the resources of social networking. By assigning scores to the songs we will be able to have the users share their progress and get others interested in using the software as well. To reiterate, we will also offer a trial period which

will allow users to “test the waters” if they see the product in a store or online. Additionally, we will reach out to the school systems, private businesses teaching bass guitar, and to stores that offer similar products in order to get them to either sell the product in their stores or, at least, get their customers thinking about using the software.

Currently the competition that my software faces is lessons offered online and businesses offering private lessons. My software, unlike the competition, will give the benefits of both the online lessons and the in-person private lessons. Major online lessons are websites such as; ArtistWorks.com, jamplay.com, StudyBass.com, and takeLessons.com. While these websites do aim to reach many of the same goals as my software, they are not implementing the most effective strategies. ArtistWorks and StudyBass give instructor lesson but does not actually track the user input directly into their system. Jamplay offers video lessons, but is not able to give feedback to a user that is improperly playing along. Finally, takeLessons offers lessons from an instructor via webcam and microphone but imposes scheduling limitations and has potential for inaccuracy due to the use of the microphone for sound input. As for businesses offering private lessons, they should not be looked at as competition as much as a possible ally. They may not only offer feedback for the system, but open a door to offering the software to those that have expressed interest in learning the bass.

My software is run on the user’s local machine, because of this there are no server fees or database hosting fees imposed on the business that increase depending on the amount of users. As more users buy the product the company will offer more content which only requires the cost of labor to produce the code. As the company hires more employees, we will also be able to expand the software to facilitate the teaching, and learning, of different instruments. Again, this will only require the cost of labor to produce such changes. If we were to expand and offer multiple instruments, the company would begin to compartmentalize into different sections that specialize in the specific instruments.

There are virtually no risks because the software does not have many costs outside of labor and packaging. The only event that would cause to stop growing would be if the bass guitar was suddenly not used in any future music. Obviously, that is not very likely but, if by some bad luck, that does occur the software still has millions of songs, lessons, and instructions to still offer our target audience.

To put it simply, we offer the same exact product to every user but what the user gets out of that experience is unique to them. The product was created with the idea that the system will grow with the user and offer feedback that is unique to their attempts. Furthermore, we are

not just teaching people how to learn an instrument but offering a way for them to be involved with their learning process. With our levels structured in a hierarchical order, that requires the user to unlock them, the system is able to transform the classroom into a game the user is eager to complete.

Music, unlike language, is interpreted and read the same way all over the globe. Any person, of any age, that has a desire to learn the bass guitar will be offered the opportunity with my software. If a person is unable to afford lessons with an instructor they will be able to learn using my software and have the proper guidance through the feedback offered. If someone is busy and lives a very spontaneous lifestyle, they will be able to learn in their free time because the system operates on the user's schedule, not the other way around.

The beauty of my software is that it only aims to help, can may only be used in positive ways. It is appropriate for both children and adults, only requires the user to have a instrument and a computer(which are both environmentally friendly), and has no need for regulation. Our system does not offer any certification for completion, but just rather the knowledge and skills to play the bass guitar. So there is no need for regulation of our lesson plan and content offered. Additionally, there are no global issues because, as previously stated, music is universal and universally encouraged.

The software has no possible uses that may be seen as unethical. The goal for the software is to act as a personal instructor for the user. The software does not compare results of other users with the software and any progress is only stored locally on the system. Furthermore, when installing and using the software the user will never be asked for any sensitive personal information so there is no risk of that being leaked to potential threats. Once installed on the system the software will cause no harm to the instrument or the computer so a bug in the software poses no risk to the user's resources.

Now that I have explained how, and why, my product is the next revolutionary idea in the music industry my final question for you is; who is ready to invest?