Musicology: your online music school and marketplace

MIS 510: Web Computing and Mining

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Introduction
Musicology is an online application/portal for users who want to either study, teach or sell music or music related instruments. Students get introduced to a musical instrument and learn the art of playing it by getting a one-stop access to online media resources and local music institutions. For teachers, musicology offers an easy and convenient route to teach about a chosen instrument. Musicology will also allow users to buy and sell musical instruments from online vendors and other users.

Competitor Analysis
We researched on our competitors using Google search engine. We recognized mainly 3 competitors who were running sponsored ads on Google about online music learning.

The Online Music Institute (OMI) has music theory teachers, music history teachers, music production teachers, as well as music composing teachers, song writing teachers and music arranging teachers. Their aim is to be the home of learning a musical instrument or subject online.

OMI is new platform and has no established presence and revenue. Therefore, its financial numbers and customer numbers are unknown.

The Berklee Online is the online extension school of Berklee College of Music, delivering access to Berklee’s acclaimed curriculum from anywhere in the world. Berklee Online offers award-winning online courses, multi-course certificate programs, and Bachelor of Professional Studies degrees are accredited and taught by the college's world-renowned faculty, providing lifelong learning opportunities to people interested in music and working in the music industry.

They have 24,427 students online and 200+ course and program offerings. A full program in music will cost a student $25,000.

ActiveBass is a free on-line community and education-based site for bassists. It was designed to allow bassists to share information about all things bass over the Internet in a manner previously unavailable. Their main educational focus is to provide tools for those that are knowledgeable to create on-line music lessons from which other visitors can learn, thereby creating a collective knowledge that all can use to further their own playing, and to allow visitors to access this knowledge in a fast and intuitive manner.
The revenue model of ActiveBass is to offer free courses but gain revenue from advertisements. Their user count and revenue numbers are unknown.

In the below given chart the features of musicology is compared with all the three above introduced and mentioned competitors.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Music Institute</th>
<th>Berklee</th>
<th>Active Bass</th>
<th>Musicology</th>
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<tbody>
<tr>
<td>Online courses</td>
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**Business Case and Model**

A glance into the news articles like the ones shown below allowed us to observe that online platform for music learning is an unexplored domain. Music being fun and good to learn, idea was developed by the team to exploit this opportunity in terms of demand for online music learning. The application targets mainly 3 types of users: students, teachers and advertisers.
The business model is designed around functionalities provided to the students, in an organized manner. This makes a sustainable business model providing reason for the students to revisit the website where he/she has access to news and trending topics relevant to their field (musical instrument) of interest which is additionally updated on timely basis.

Students can be free unregistered users, registered and premium users. Teachers can teach instrument of their choice and are not divided into any groups. Advertisers can post ads on the website and affiliates can expect traffic to originate from the application.

**Revenue Model**

When students create profile and sign up for specialized account they get access to learning from tutors by uploading their videos and receiving feedback and tips. All these features can be obtained by paying per usage or as a package by paying a premium which will result in revenue for the website owners. On the other hand, users with unpaid accounts have access to multiple features with essential interactive-learning experiences such as discussion forums, peer feedback tips and sample YouTube learning videos attracting users of all ages.

The application will also attract advertisers and affiliates who would wish to sell musical instruments to the students. Hence revenue will be earned by providing gateway to Amazon and also listing sponsored ads on the musicology website. The revenue channels and model are captured below.
Key Scenarios

Guest User

Home screen

- As highlighted in red, the website can cater to 4 different categories of instruments. The scenarios and screenshots explained here are with respect to different sets of customers that the application can cater to:
• For the features 1, 2 and 3 highlighted in light blue the explanation is as below

➤ Is Musicology’s personal wall and users can leave their messages either by logging into one of their email accounts: Google, Facebook, Yahoo and AOL

➤ Stores near me is an interactive Google Map providing “Location based information” regarding where an user can look for musical instruments(all 4 categories)

➤ Analytics is a section where user has access to information in the form of graphs providing information/sentiment analysis about the “most popular musical instrument brand” and other relevant stats from data collected through repository such as Twitter stream
• The homepage also contains, lessons uploaded by users who have signed up as “tutors”: This includes audio lessons, video lessons and backing tracks
• The features also include twitter live stream, Amazon direct-buy widget and an option for the user to contribute to Musicology hash tag through logging in to his own Twitter account
Free User
User has an option of signing up with the website and get more personalized features.

As highlighted in the screenshot, the user is provided with additional features as compared to guest users. Upload Submission, for users to upload a video from their YouTube accounts or record one on web cam. The users can also attend a live class by using the call code and connect from anywhere. Additionally, users have access to look at a list of courses registered before.
Premium User

Premium users have an additional feature where they have the contact details for tutors available. And they can schedule a meet with his/her respective teacher as planned.
**Novelty**

**Teacher-Student, Student-Student Interaction**

The interaction between teacher and students are the key to the success this application. To empower this feature multiple mediums are enabled. Skype chat and video chat are the direct, real time means of interaction. Also, users can interact by sharing videos on Youtube thereby sharing and reviewing the material/ work of each other.

**App for mobile users**

The musicology application is designed and developed keeping in mind the SOLOMO trend in today’s world.

The 'mobile' part of the SOLOMO means that the application should be compatible and be usable from any type of device. Hence the application was designed and developed to be compatible and usable from devices ranging from desktop, laptop, tablet, smart phone and similar computing devices.
Geography/Location based search
To support 'location' part of SOLOMO, the application has a feature which enables to search musical instrument selling shops by location. The users location is automatically detected and shops are shown based on selected instrument on Google Map as shown below.

Cloud based architecture
The entire application is hosted on Amazon's EC2 instance as shown in the system architecture diagram given below. The application was developed using XAMPP. XAMPP is the most popular PHP development environment. XAMPP is a completely free, easy to install Apache distribution containing MySQL, PHP, and Perl.

All the APIs and analytics are made to connect with the application's MySQL database deployed on the cloud.
APIs Implemented

**Facebook Login, Share, Like**
The web application has a functionality to login through a user’s Facebook id. We have also connected the application to the Facebook fan page which the user can like & share.

**Skype**
Through the application, a premium user can also call their instructor in real-time using the Skype plug-in. The Skype plug-in places a call using the user’s Skype id directly to the instructor’s ID. This way, the premium user can have one-on-one sessions with the instructors.

**Video Chat**
The video chat functionality allows a teacher to teach multiple students at one time using the screen sharing capabilities. Multiple students can learn from a single teacher at 1 point of time.

**Sound Cloud**
The SoundCloud plug-in was used to enable users to listen to their personalized instructors playing a certain lesson. This feature is essential for users to practice their homework assignments. This allows them to access audio lessons that their instructors may have uploaded.

**Amazon**
The Amazon store gives a user the functionality to buy musical instruments or accessories of their choice right from the website. This feature makes the user not leave the website for their shopping needs at all.
**Youtube (Data, Analytics)**
We have used the YouTube API to fetch videos in real-time. Relevant music videos related to a particular musical instrument can be fetched in real-time. The YouTube analytics API was used in order to allow the user to upload their personal video. The admin of the website has the authority to approve or reject the video. Once approved, the video submission is sent to the teacher for feedback.

**Google Places (Geo-Location)**
This functionality locates the user’s location & finds out their latitude & longitude. Using these coordinates, it shows the user the nearest stores that sell a musical instrument of their choice.

**Tableau Public**
Based on the tweets collected, we performed sentiment analysis on the tweets. We found out 2 interesting insights. PhplInsight was used in order to perform sentiment analysis. Based on our analysis, Guitar was the most trending musical instrument. Also, Gibson was the most talked about instrument brand. Based on these metrics, we found overall sentiments for all tweets & aggregated them in a bar chart.

**Team Members and Contributions**
The whole project was successful because of the contribution of all 4 team members. Some of the team members concentrated more on technical development and some others more on logistics and analytics which were done outside of the web development.

Jagdeesh Narayanan - Business case constructor, API integration, website design and development, team management, concept development

Krishna Pavan Bhat - Cloud architecture deployment and support, twitter analytics programming, logistics and non-technical support, concept development

Sagnik Roychowdhury - Idea generator, API integration, website design and development, concept development, twitter analytics development and support

Prajwal Shirurkar - Team management, Business case constructor, API integration, website design and development, back end programming, concept development
Future Extensions
The application has a great future provided the present functionalities and features are not only improved but are also boosted with additional attractions.

Going forward there are at least four important items identified for implementation.

More Musical Instruments
Presently the application supports only 4 musical instruments which is 1 instrument each under 4 categories of musical instruments. Going forward the team has vision of including unlimited number of instruments under various categories, make type and brand names.

Marketplace
The marketplace feature is to enable users to buy and sell used/new instruments within the application for a minimal transaction fee. This will provide another stream of revenue to musicology. By doing this musicology can become the 'one-roof' platform to learn and teach music as well as for e-commerce of music related instruments and products.

Payment Gateway
To enable and implement the vision of having a marketplace within musicology as well as to provide option of buying sponsored products a payment gateway will have to be integrated to musicology application.

Advance Analytics
The internal user behavior and social media analytics will be a key functionality and feature for musicology, teachers and students. Hence the existing analytical feature needs expansion and advancement into broader and larger use cases. This can be done using advanced statistical and machine learning techniques.
References
Online Music Institute website: https://onlinemusicinstitute.com/index.php
Online Berklee: http://online.berklee.edu/
Active Bass: http://www.activebass.com/