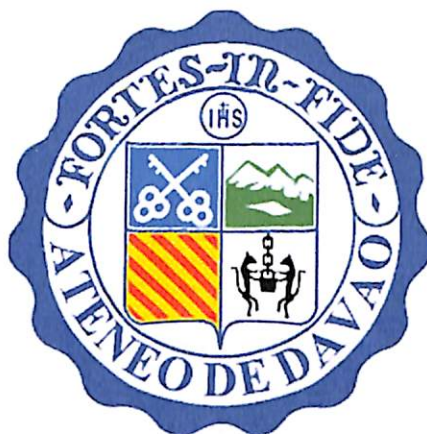


**DEVELOPING A FILIPINO ETHNIC MUSIC COMPOSITION TOOL IN
ANDROID PLATFORM**



By

Morales, Edmund Dave L.

Reynoso, Rael B.

SCHOOL OF ARTS AND SCIENCES

ATENELO DE DAVAO UNIVERSITY

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**DEVELOPING A FILIPINO ETHNIC MUSIC COMPOSITION TOOL IN ANDROID
PLATFORM**

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Morales, Edmund Dave L.

Reynoso, Rael B.

SCHOOL OF ARTS AND SCIENCES

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Ateneo de Davao University

COMPUTER STUDIES DIVISION

SCHOOL OF ARTS AND SCIENCES

P.O. Box 8016 Davao City

Philippines

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EDMUND DAVE MORALES AND RAELE REYNOSO, Ateneo de Davao University

ABSTRACT

Filipino ethnic music instruments are more entertaining to listen if is being applied in an android application, especially now that we are in the Digital Era. Nowadays, Philippine musical instruments seemed to be non-existent because only a few have been playing and popularizing them. This study discusses about creating an application for android that uses three kinds of Filipino ethnic musical instruments as a context of a music composition tool. It includes a composition too in which users can freely create, compose and listen to their composition. Few technology inclined minds have been resorting to creating and selling android systems for income purposes. Filipinos, especially youths, will appreciate this kind of application and as well as people who are fond of music composition. This application is a tool for those music enthusiasts who are planning to make an ethnic music composition. Building this application will need specific knowledge of java programming language and as well as sound management. The users of this application would be a person who has an android mobile phone. Hopefully, though this application, the flame of Filipino ethnic instruments will be rekindled.

Key Words and Phrases: Music composition tool, Android, SoundPool

1. INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Now a day's people tend to forget our own traditional musical instruments. With this application, the proponents will be able to reintroduce the sound of the Filipino ethnic musical instruments with ease and modernity. It would be a help to those people who have longing interest to compose and mix using Filipino ethnic musical instruments. This application will reintroduce the sounds of the Filipino ethnic musical instruments to those people who have forgotten it and as well as youths who have no idea and have a hard time listening on it. By using this application people will understand and appreciate on how to compose and mix using Filipino ethnic musical instruments. Developing this tool would make people realize that Filipino ethnic musical instruments are interesting to listen. We could help those people who love Filipino ethnic music instruments to develop music through the use of this application. Lots of people now have lost its appreciation to our own ethnic musical instruments that's why this tool could be a big help to those people who lost its contact to it. To develop this kind of tool would give a way to our traditional musical instruments to remember.

1.2 TECHNOLOGY APPLICATION CONTEXT

The study focuses on reintroducing the Filipino ethnic musical instruments as a form of an android application. The main function of this application is to create, compose and mix the sound of the three ethnic musical instruments. At the end of the composition they can listen to it and save it as their tone. We used soundPool class for the musical instruments and used it as the basis of our application. SoundPool class will be easy for us to program the sounds of the recorded ethnic musical instruments. The I.D.E. we used was Eclipse since android application uses java programming language. We used eclipse to implement soundPool because soundPool is built in sound library on eclipse. The materials we used in recording the notes were laptop and a microphone. We also need to polish the sounds that we had recorded to make the sound smooth. The recorded instruments will be process using Audacity, free software to filter unnecessary sounds in order to smooth the recorded sounds of the ethnic musical instruments. This research will be useful on our application because it enhances the sound that the composition tool produces upon mixing the sound of the instruments and as a result, the flow of the music

when played will have a good results/output. To implement the functionalities of composing and mixing we will use java programming language via eclipse. In designing the layout and images, we will use adobe Photoshop to make the application more interesting

1.3 OBJECTIVES OF THE STUDY

The general objective of this research is to develop a Filipino ethnic music composition tool in android platform.

The specific objectives:

- To be able to composed of each musical instrument
- To know how to implement Frequency balancing, volume control in mixing the sounds of instruments
- To know how to assign the musical notes according to its corresponding instruments using eclipse.

1.4 SIGNIFICANCE OF THE STUDY

The significance of the study is to expose users to traditional instruments. Those people who use android mobile phone will be entertained if they will be exposed to traditional instruments. Filipino ethnic musical instruments would be reintroduced and inform the users that these instruments are fun to listen with if it is a context of an application for android. This application would prove that composing and mixing is fun and exciting. Users that has difficulty in learning and listening our own ethnic music would probably realize and make them appreciate the application. This research would also prove that creating a composition application for Philippine ethnic instruments would make the research expand as a way that other proponents will give importance on the ethnic musical instruments.

1.5 SCOPE AND LIMITATIONS OF THE STUDY

The Filipino ethnic instruments represent the Filipino ethnic music of the Philippines. Combinations of these instruments when played would lead us in creating an android application that could mix three instruments the agung which is a set of two wide-rimmed, vertically suspended gongs used by the Maguindanao, Maranao, Sama-Baiau and Tausug people of the Philippines as a supportive instrument in kulintang ensembles. The kudlong which is a Philippine two-stringed, fretted boat-lute. It is the only stringed instrument among the Maguindanao people, and one of several among other groups such as the Maranao and Manobo. The last instrument is Sarunay which is a type of Philippine metallophone with eight tuned knobbed metal plates strung together via string atop a wooden antangan (rack). Kulintang a tiniok is a Maguindanawon term meaning "kulintang with string" but they also could call them kulintang a putao, meaning "kulintang of metal." In each instruments played it could be possible to adjust the speed of the tone, pitch and as well as adjusting the volume, it will be used to mix all the three instruments. The composition tool has the capability to mix three instruments Kudlong, Sarunay, and Agung. The study covers only one programming language such as JAVA programming language in terms of Object Oriented Programming particularly the programming features such as the MVC framework. The present study is concerned with the revival of Filipino Ethnic instruments in an android application. It is limited to compose and mix three ethnic instruments. The composition is only good to 20 taps for each instrument. It uses soundpool class in manipulating the sounds. The output is intended for android users and as well as music enthusiast who wanted to hear and listen an ethnic music composition and to enliven the traditional ethnic instrument for the purpose of reintroducing Filipino ethnic musical instrument to the Filipino people.

1.6 DEFINITION OF TERMS

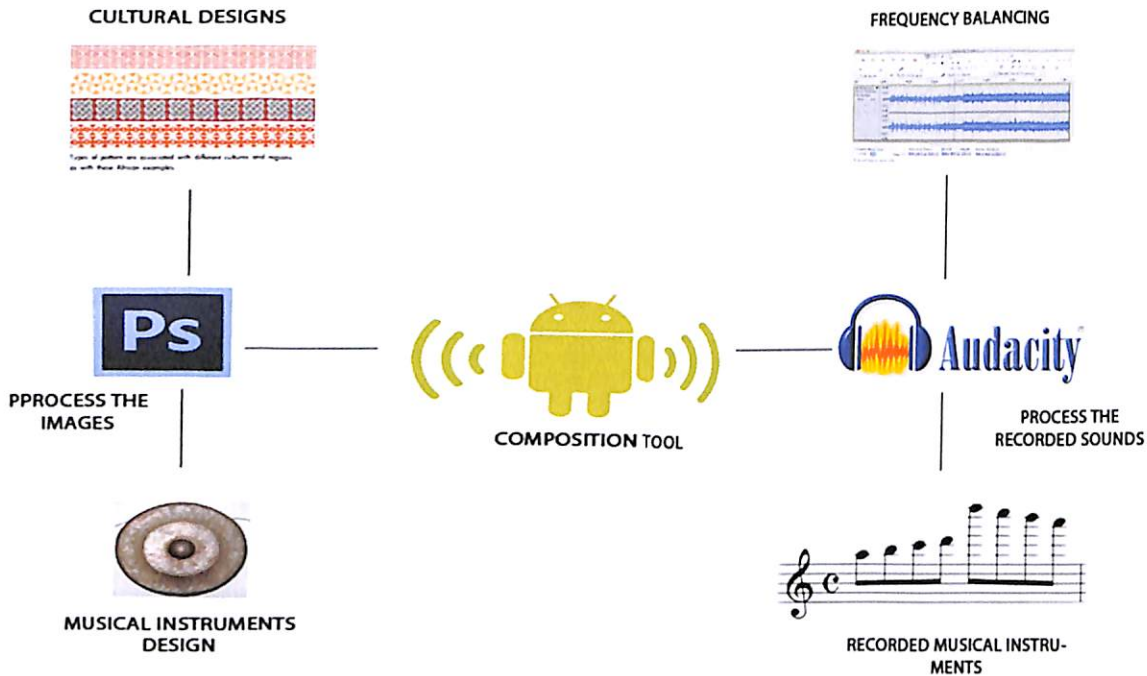
1. *Frequency Balance* – mixing technique used to equalize the frequency of the left and right channels of a stereo.
2. *Noise Reduction* - An electronic process used to reduce noise levels in audio and video. In video, the most effective noise reduction is accomplished by digitizing the video signal and carrying out a computerized pixel by pixel analysis of the data. In audio, the most effective systems employ an encode/decode scheme, performed before and after recording, such as the Dolby audio noise reduction system. Noise reduction can be performed on an existing audio signal using systems such as DNR (dynamic noise reduction) but are less effective because they also affect the audio signal.
3. *Composition tool* – A tool capable of arranging several things to form a unified whole
4. *Android* - is a mobile operating system developed by Google? It is used by several smartphones, such as the Motorola Droid, the Samsung Galaxy, and Google's own Nexus One.
5. *The Android operating system (OS)* - based on the open Linux kernel. Unlike the iPhone OS, Android is open source, meaning developers can modify and customize the OS for each phone. Therefore, different Android-based phones may have different graphical user interfaces GUIs even though they use the same OS.
6. *Android phones* - typically come with several built-in applications and also support third-party programs. Developers can create programs for Android using the free Android SDK (Software Developer Kit). Android programs are written in Java and run through Google's "Davlik" virtual machine, which is optimized for mobile devices. Users can download Android "apps" from the online Android Market.
7. *Volume control* – the act of manipulating the loudness and softness of the sound.
8. *SoundPool* - The SoundPool class manages and plays audio resources for applications. A SoundPool is a collection of samples that can be loaded into memory from a resource inside the APK or from a file in the file system. The SoundPool library uses the MediaPlayer service to decode the audio into a raw 16-bit PCM mono or stereo stream. This allows applications to ship with compressed streams without having to suffer the CPU load and latency of decompressing during playback.

2. REVIEW OF RELATED LITERATURE AND TECHNOLOGY APPLICATION

The Filipino ethnicity was the basis in making the design of our application. The musical notes that are present in the main menu including the three instruments it all comes up with the tribal background cloth. The ethnic concept background of the application serves as a hint that the application involves Ethnicity. The Maguindanaon inspired background tribal cloth was used in making the designs of the application. The blue and red background color of the main menu was use to represent the Philippine culture, it is inspired with the Philippine Flag. The design was implemented in the application using xml (Extensible Markup Language). The Maguindanaon has an exquisite hand-woven fabric called Inaul, which is interlaced with multiple colors, as well as, gold and silver threads. The colors of the fabric and depicted symbolic-motifs reflected the splendor of Muslim culture. These designs were used in our application, it can be found at the composition menu which was layered on the instruments as a background image. The design of each instrument was based on their real notes. The agung in the application was seen hanging just like a real agung. The design of the sarunay is also the same with its original image which has an eight note. The design of kudlong was based on its original image; instead of using strum pattern movement to compose the tap pattern movement was used. The tap pattern movement was based on the notes of the kudlong. In mixing the sound of each composition, the elements that was used was frequency balance and volume control.

A research made by Dickinson Daniel named Blue Skies which is a site-specific interactive soundscape composition that integrates live musician and algorithmic improvisation into a sound installation that reacts to changing environmental conditions, this work is somewhat connected to our research because it tells on how they integrated their music composition to a live musician . Another research which is made by Rebecca Anne Fiebrink which they build an application of supervised learning algorithms to contemporary computer music composition and performance, this research can be helpful in our research to improve the performance of our application by implementing this kind of algorithm in the context of ethnic music as a creative tool. A research by David Ralley where he explores the possibility of using an interactive genetic algorithm as a means for developing a user supplied melodic idea, freeing composers from finding developmental material, and allowing them more time evaluating possibilities proposed by the system, the concept of this research is somewhat connected to our topic it gives the user an ease of access by supplying melodic idea through an application. A research by Brigit Elizabeth Hawley which is named a QuickieComposer application it is a program intended for use on Android Devices. The QuickieComposer is an android application wherein the user can compose melodic music, which is somewhat connected to our research by composing directly and opening the application you can easily compose music that is already on the application. A research made by Henz and Martin which is a COMPOzE, the goal of the work is to derive four-voice music pieces from given musical plans, which describe the harmonic flow and the intentions of a desired composition, the concept of the research is connected to our research also wherein the user can choose the instruments and the harmonic flow of the composition and its blending composition. A research made by Henrik Ekeus et.al studies the predictability and the pattern of music that uses melody triangle, an interface for the discovery of melodic materials, where input positions within a triangle directly map to information theoretic properties of the output, the concept of this research improves the performance of our application by exploring how the music flow in a context of ethnic music. A research made by Feehan and Noah Landwehn which is named Syncwalk he used this framework to create a large-scale participatory project that will allow anyone to sound- design his or her neighborhood space, the concept of Feehan an Landwehns' research could enhance the performance of an application by using environmental space like bringing music to a particular space on how to design or compose the sound in a particular place.

3. PROJECT METHODOLOGY



3.1 RESEARCH

Below are the research processes conducted by the proponents:

1. *Research on appropriate ethnic musical instruments*- The proponents selected existing Philippine ethnic musical instruments as the main subject of their project.
2. *Research on historical contents of the selected musical instruments*- Historical background research is being considered by the proponents to assure the existence, ethnicity and origin of each musical instrument.
3. *Research on editing, composing and mixing applications*- In order to be familiarized with the tools and processes to be used in editing, composing and mixing, the proponents researched on what appropriate applications should be used, how to apply composing, mixing and manipulating techniques in the chosen application.
4. *Research on appropriate codes*- The proponents researched for appropriate and relevant codes useful for creating the project. This process has been essential in implementing the functionalities of composing and mixing.
5. *Research on techniques applicable for the mixing process*- To achieve a successful mixing element of the application, the proponents researched for its possible components.

3.2 DESIGN

The Maguindanawon inspired background design of the application was researched through the internet. Hence, it was also being suggested by the local artist, Neil Cervantes. Since most of the musical instruments that were recorded originated from Maguindanao. Images of the musical instruments were also acquired through internet, and then edited through adobe Photoshop cs5. Editing and enhancement processes such as cropping, drop shadow, outer glow, and texture were applied to the background, buttons, and images. After editing in the adobe Photoshop, images were saved as .png file, copied and pasted to the XML in the Eclipse, for further layout editing option. The musical instruments was edited using adobe Photoshop cs5 and was saved as .png file, it was later used as in an .xml layout in the application. This process was uniformly done in each of the instrument. The composition design was built using adobe Photoshop cs5 wherein we look for a Maguindanawon background and edit it through cs5 and with the design edited we put the musical instruments above the layer of the background. In Mixing we implemented a random generated button that will get the save composition in the database and will be automatically generated. We also layout the images in order to be properly aligned.

3.3 IMPLEMENTATION

The researched processes were fully implemented upon the creation of the project. Moreover, the proponents assigned the recorded and edited notes according to its musical instrument. The tools that was used in order to develop the application were adobe Photoshop cs5 for editing the images and making designs, android phone for the application to be tested, Eclipse IDE, for making the functionalities work, the composition components and as well as the mixing components. On developing the application it was necessary to lower the .wav files from 600kb to 15kb so that each of the composition could have 20 taps. The original design was difficult because it could only cater 4 taps on each composition. It would be better to lower the .wav files using a file reducer which is the audacity.

3.4 TESTING

The testing phase is where the proponents try and test the over-all functionalities of the application if it works based on the objectives. This is also the debugging stage-where codes are being debugged (or cleaned to test if it works correctly). Aside from debugging, error-checking is also being conducted for the proponents to know if there are errors in the overall codes. The error checking was done through the use of testing each of the functionalities of the application, we make use of `log.i("test")` and `system.println("test");` to determine whether the code functions or not.

3.5 USER ACCEPTANCE

This is the part where the proponents conducted a survey to the android phone users and song artists/composers. The main goal of the survey is to know the recommendation and reactions of the future users of the application. Furthermore, the survey serves as an evaluation to the level of acceptance of the users to the created application. We come up with a total of six questions that will be ask to users in order to know the strength and weaknesses of the application so that we would able to stress some important facts that are needed to be changed or to be continued by the next proponents of the study if there will be.

4. TECHNOLOGY BACKGROUND

4.1 AUDACITY

Wikipedia.com defines Audacity as “a free, easy-to-use, multi-track audio editor and recorder for Windows, Mac OS X, GNU/Linux and other operating systems. We use audacity to edit the wav file of the recorded sound of the instruments. The .wav files are lowered using audacity.” The software audacity is one of the most essential tools in creating the application. It is where the proponents recorded and edited the musical instruments.

4.2 ECLIPSE

As defined in the Wikipedia, “Eclipse is a multi-language Integrated development environment (IDE) comprising a base workspace and an extensible plug-in system for customizing the environment. It is written mostly in Java. It is the core of our application wherein we use it to develop the application.” This is where the proponents create and develop the application.

4.3 SOUNDPOOL

Based on Wikipedia a “SoundPool is a collection of samples that can be loaded into memory from a resource inside the APK or from a file in the file system. We use the soundPool to initialize the recorded sounds in eclipse”. The built in sound class on eclipse called soundPool would be the building blocks of our application wherein we could manipulate and manage the sounds of the musical instruments.

4.4 PHOTOSHOP

As described on Wikipedia, “Photoshop is the leading digital image editing application for the Internet, print and other new media disciplines. We used it to design and edit the backgrounds of our application. The primary use of Photoshop is to create, edit and enhance images to be applied in the application.