APPLICATION OF RECOGNITION AND LEARNING CHORD GUITAR BASED WEB (CASE STUDY COURSE ON GUITAR IN GENTRA RINEKA)

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ABSTRAK

In this final project is designed and manufactured Applications and Introduction to Web-Based Learning guitar chords by applying the Fast Fourier Transform Algorithm on an application being made. This application is created using PHP and Java programming language.

Application Introduction and Learning guitar chords are made as a medium of learning that aims to facilitate the activities of learning guitar chords. This application is made in the form of websites and desktop forms. At the application site aims to means of information required in learning the guitar chords, where there is data processing done by the teacher in managing pupil data, materials, and data problems. On the desktop application intended as a medium of learning that prioritizes practical.

Guitar chord is a collection of three or more tone and establish a tone in a chord. A chord has to have an assessment of frequency, so in this case there is no recognition process the input signal or vote for the new converted into frequency. Desktop applications using Fast Fourier Transform algorithm for multiple input detection process the incoming tone. These algorithms used to analyze and select what frequency scale resulting from an input tone on the guitar to match the standard provision in a tone frequency. The process of sound recognition are included on the guitar tuning, exercises and games.

***Keywords** : Applications of Learning, Guitar chords, Online, Fast Fourier Transform, Sound Recognition.*

1. INTRODUCTION

Gentra Rineka is a non-formal educational institutions to develop a traditional and modern art. Especially for the courses conducted by private guitar lessons from one teacher with one student. Limitations of private time to make progress in studying gitarpun little slow. This was due to teachers not fully guide the students in practicing guitar chords, but must deliver an important theory about the guitar to be understood by students.

Gentra Rineka Based on experience, learning guitar privately in the success rate is better when compared with group learning. However, students sometimes feel awkward dealing directly with teachers so that muridpun more difficult to improvise, expression, and creativity in playing guitar. Responding to the pengajarpun advise students to practice more outside of class hours.

The implementation of learning outside class hours is the development and improvement in teaching. For people who still lay or a beginner, practice and learn the guitar in particular who is learning guitar chord itself is not easy. The lack of knowledge and experience make it difficult beginner in knowing whether or not the chord being played at the beginners to practice their own. In addition, beginners will have difficulty in setting the standard in guitar tone. It is proved that a beginner still need a teacher in practice and learn guitar.

Recognition applications and web-based learning guitar chords are expected to bring students to train and direct practice in learning guitar chords. Therefore, these applications require sound recognition

process for detection of the incoming tone. Also of some existing algorithms, Fast Fourier Transform algorithm is very suitable to perform the detection of a tone which has a frequency that has been standardized assessments.

Of these problems required an application that can be used as a medium of learning that can assist students in practicing and studying the guitar outside class hours. To overcome some of these problems then be made Introduction Application and Web-Based Learning guitar chords.

2. MODELS, ANALYSIS, DESIGN AND IMPLEMENTATION

This method is used as a guideline writers how and what to do during the design and manufacturing applications. The steps being taken by using a waterfall model (Ian Sommerville).

a. Requirement Definition

Collecting the complete needs and then later analyzed and defined the needs that must be met by the program that will be built. This phase should be done in full to be able to produce the complete design.

b. System and Software Design

Design is done after completion requirements are collected in full.

c. Implementation and Unit Testing

Design courses translated into codes by using a programming language that has been determined. The program is built directly tested both units.

d. Integration and System Testing

Unification of the program units are then tested as a whole (system testing).

e. Operation and Maintenance

Operate the program in their environment and perform maintenance, such as adjustment or change because adaptation to the real situation.

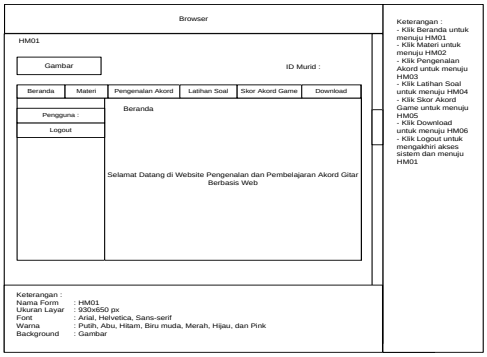
There are five actors in the introduction and application of learning the guitar chords, the owner (superadmin), teacher (admin), student, guitar (hardware), and visitors. The task of each actor can be seen in the diagram Use Case in pictures 1.



Gambar 1 Use Case Diagram Application of Learning chords

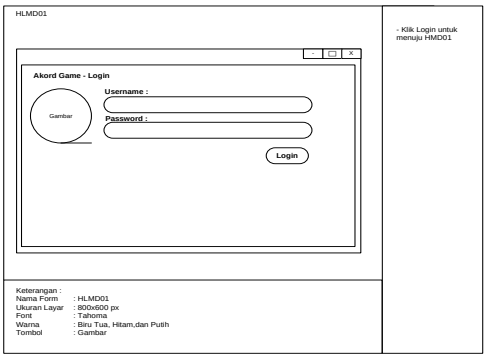
Interface design aims to provide a snapshot of the system to be built. The design is implemented into a program that is intact and can be used by users of the system.

Interface Design Home (website) can be seen in the picture 2.



Gambar 2 Interface Design Home (website)

Chords Game Menu Interface Design (desktop) can be seen in the picture 3.

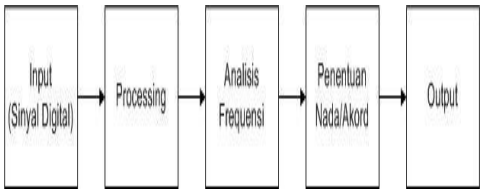


Gambar 3 Chords Game Menu Interface Design (desktop)

Tests on the system is divided into two parts, the functional testing alpha and beta testing. For functional testing focused on using black box method that focuses on the functional requirements of software that is built.

2.1. Sound Recognition Process

Sound recognition is a technique in order to allow the engine to hear and understand an input in the form of sound. On systems that have built sound recognition in the manufacturing process introduction and application of learning chords. A recognizable tone with the amount of spectrum that originated from the input of a digital signal. In a simple detection of a tone or chord can be seen in the picture 4.



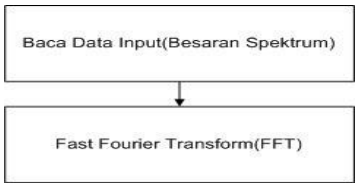
Gambar 4 System Block Diagram Sound Recognition Process

2.1.1. Data Acquistion

Input digital signal is taken from the guitar sounds that are connected with sound card. Guitar sound that is taken only in the form of digital signals generated from an electric guitar.

2.1.2. Processing

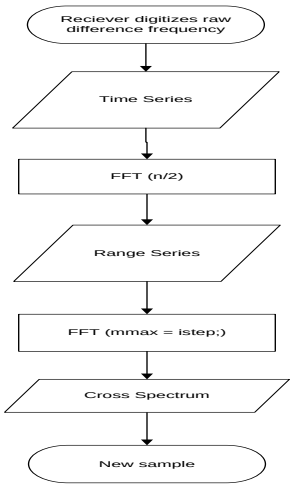
Processing at an early stage, that is done reading the input data in the form of scale in the form of frequency spectrum and analyzed using Fast Fourier Transform (FFT). Processing can be seen in the picture 5.



Gambar 5 Transformation Into Digital Signal Frequency Magnitude

2.2. Flowcharts Fast Fourier Transform

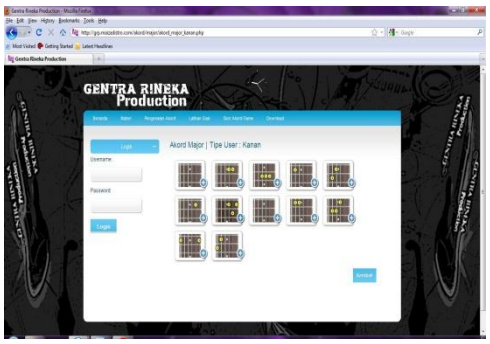
Flowchart of fast Fourier transform, a procedure to find and share digital signal into pertapis (as a simplification of digital signals which then becomes a new signal that will be matched with the data set). Flowchart of fast Fourier transform can be seen in the picture 6.



Gambar 6 Flowcharts Fast Fourier Transform

3. RESULT AND DISCUSSION

From analysis and design that has been done, as for the results of the application that is built can be seen in picture 7 and 8.



Gambar 7 Dekstop Interface



Gambar 8 Dekstop Interface

4. CONCLUSIONS AND SUGGESTIONS

4.1. CONCLUSIONS

Based on the comparison between the development objectives of the system being built with alpha and beta testing results, it can be concluded as follows:

1. Application recognition and learning the guitar chords to overcome the limitations of time in learning the guitar chords in the course Gentra Rineka Production.

2. Application recognition and learning the guitar chords to overcome the awkwardness of students during the learning done in private.

3. Application recognition and learning the guitar chords to give a positive effect, ie more students to improvise, be creative, and be creative in playing guitar.

4. Application recognition and learning the guitar chords to help students overcome difficulties in knowing whether or not a chord that is played.

Application recognition and learning the guitar chords to help students in setting the standard in guitar tone.

4.2. SUGGESTIONS

Viewed from the advantages that exist, an application must have the defects that are likely still to be developed again in the future. As for the suggestions in the development of this application are as follows:

1. For completion, this application can be built in the form of more complete information system according to the needs of a much more useful in the future.

2. For development, these applications can be developed into an online-based applications more usable by using speech recognition technology. In addition, applications developed to suit the abilities of students or a more difficult level (proficient).

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