IMPLEMENTATION OF ENGLISH LEARNING USING SPEECH RECOGNITION TECHNOLOGY
(Case study at SMA Negeri 1 Serang Panjang, Subang Regency)

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Abstract

English is a language of communication that plays a very important role in connecting between countries. In communicating can convey orally or in writing so that there is no misunderstanding in providing information. People from various countries are encouraged to learn English to add insight in keeping up with the times. In Indonesia itself, English is a foreign language that must be learned, from elementary school to university level, to introduce English to students so that it can be applied in different and fun methods, the design of Speech Recognition applications based on windows 10 and Android it is hoped that it can accelerate the application of English much more interactively and increase students' interest. Speech Recognition itself (speech recognition) is the development of techniques and systems that allow computers to receive input in the form of spoken words. This technology allows the device to recognize and understand spoken words by digitizing the words and matching the digital signal to a specific pattern stored in the device. Spoken words are converted into digital signals by converting sound waves into a series of numbers which are then matched with a special code to identify the words.

Keywords: Application, English, Speech Recognition Technology

1. INTRODUCTION

The implementation of a decentralized education system due to the enactment of Law No. 22 of 1999 concerning regional government autonomy has an impact on the implementation of education management, namely forming management that provides wider space for education management to find competitive strategies in the competitive era to achieve quality education outputs. and independent, improving the quality of education is very necessary for every school with the mission of educating the nation's life and fostering creativity and innovation of students, the increase is aimed at forming a professional teaching system and is an absolute demand and must be met for the world of autonomous school education (Maulida & Aminah, 2020; Achmad, 2021).

According to the National Board of Indonesian Education Units, English education is one of the mandatory components in improving the education unit level curriculum (KTSP) for middle and high school levels. Education policies and subject curricula can provide contextual coverage and expectations that can encourage students' learning processes to be more active, creative and organize students' futures to be much better. English is a language of communication that is often used between countries orally and in writing to provide information. People from various countries are encouraged to learn English to add insight in keeping up with the times. English is a foreign language that must be learned in Indonesia, starting from the elementary school to the university level (Rahmawati, 2016; Rubiana& Dadi, 2020).

As we know the existence of English as one of the most widely used international languages in the world, making English a second language that must be learned and developed in various countries, as well as in Indonesia, English is always put forward, especially in the world. National Education. English as an international communication language is very important to learn in various sectors, and Indonesia is one of the countries that now use English as a second language. However, not all Indonesian people use it and study it in depth. Therefore, learning English is also very important in learning activities. Learning English has become a necessity in the international world, so learning English is a separate need for students in facing various challenges and competition in the very complex world of work (Fadhilah, 2012; Putra, 2020; Muhammad &Adila, 2021).

English is a subject that students at school must master, while the four basic competencies in its delivery include, reading, writing, listening and speaking. English is one of the main subjects that students must master to be able to follow the development of science and technology, of course, there must be a commitment from the school to organize English learning better by referring to teaching methods that aim to increase grades exams for students at school.

Along with the development of smartphone technology with various operating systems, this technology should be used appropriately to help and facilitate various ways, especially in terms of

teaching and learning students at school. The most popular operating system used by developers is Android. With this operating system, everything related to technology can be more practical and interesting on a smartphone. One of them is in the world of education, such as English subject matter presented in the form of an application. The application can help students learn English directly by accessing the material in the application via smartphones anywhere and anytime. However, in designing the application, it is necessary to involve elements of education with some entertainment in it, so that students not only get learning materials, but also can play to test their ability to master learning materials in the information media (Prasetijo & Isnanto, 2011; Yugafiati et al., 2020; Yudhistiro&Silalahi, 2021).

The use of smartphone technology that can provide convenience for students in learning English education at school can be emphasized on two important aspects: educational media as a learning tool and games as a means of playing while honing students' abilities to be more creatively active. Speech Recognition is one of the Android smartphone-based application designs that can be an alternative learning media for students in mastering and studying English education at school, the application was deliberately created in an educational game called Speak English using Speech Recognition technology, an application it displays an image combined with text and audio. The function of Speech Recognition technology (voice recognition) is as a voice output from the application for the user to listen to and receive the voice input spoken by the user. It will be adjusted to the words and images displayed (Dawson et al., 2014; Ahn& Lee, 2016; Dini et al., 2020).

Speech recognition, also known as Automatic Speech Recognition (ASR), is a technology applied to software to receive input in spoken words. This technology allows a device to recognize and understand spoken words by digitizing the word and matching the digital signal with a certain pattern stored in a device. Spoken words are converted into a set of numbers which are then adjusted to certain codes to identify these words, Speech Recognition is a library that has been integrated with the Android operating system provided by Android for the speech recognition feature, where it can store data in a local database. The voice identification process is carried out by digitizing the spoken word and using a benchmark in the form of sound emphasis level.

2. METHOD

This English learning application is designed using the SDLC (System Development Life Cycle) software design method where the design is carried out in stages according to the stages in the SDLC. As for the object of research determined in the formulation of this problem, it is carried out on class X students of SMA Negeri Serang Panjang, Subang Regency with a total of 40 students. The reason for choosing SMA Negeri Subang is due to the lack of achievement in learning English for class X students and various difficulties for students to communicate actively in applying good and correct English learning methods.

The analysis phase investigates an ongoing system to get answers about the use of the system, how the system works, and when to use the system. Design is the process of determining how the system works in terms of architecture design, interface design, database and file specifications, The implementation of the system development process, system installation, and test system support plan is a process of testing the functions of the applications that have been built, then entering the evaluation stage of the system that has been successfully built and then evaluating its advantages and disadvantages as well as the continued use of the application in the future (Sofyan et al. al., 2016; Muhammad &Alimudin, 2018; Xiao, 2020).

3. RESULTS AND DISCUSSION

Application Design Overview

The application developed is an application that utilizes the Cloud Speech API service for English learning media using speech recognition technology. The architecture of the cloud speech API used can be seen as shown in the following figure:

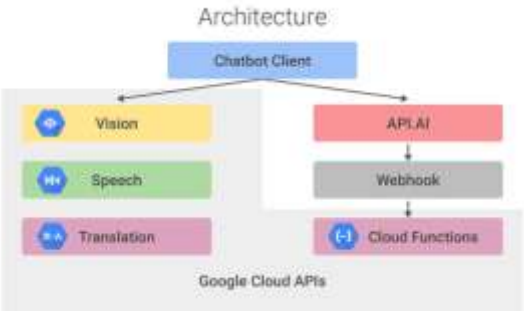

Figure 1. Speech recognition system application

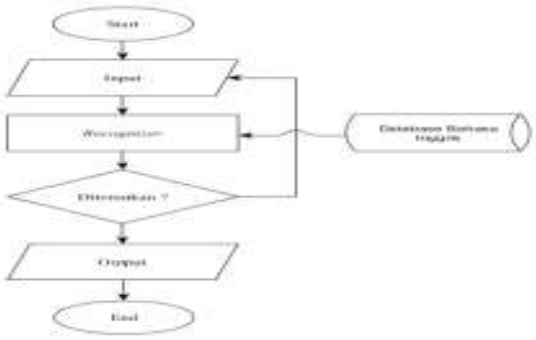

Figure 2 Flowchart of voice to text conversion

The process is running this game is that the user must first press the image according to the game command. Then the user pronounces the word using

English. After that, the block recognizer will perform the recognition process and convert the voice into text. Below is the block recognizer flowchart:

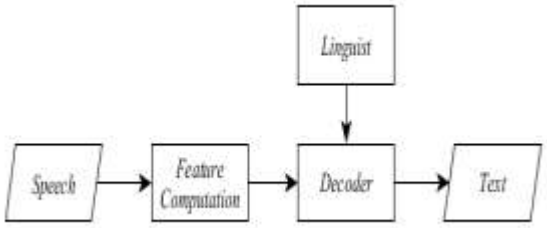

Figure 3 Block Recognizer flowchart

Some of the functions contained in the Block Recognizer flowchart include (1) Feature Computation, which functions as a converter of sound waveforms into unique codes to be used in the speech recognition process, then (2) Decoder is a core part of the voice recognition (Saputra et al., 2017; Londhe&Kshirsagar, 2018).

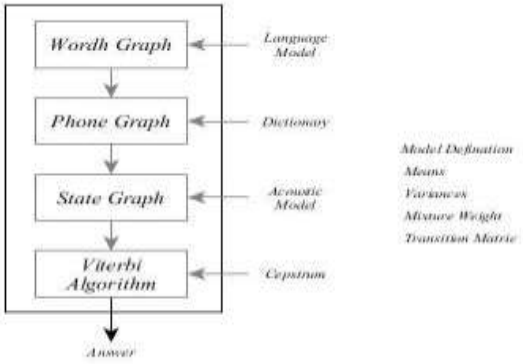

Figure 4 Resource Usage by Decoder

The flow of decoding, in general, can be described with the following explanation, (1) Word Graph is a graph of words expressed as a graph given a table and presents a grammar where each node (dot) consists of only one word (2) Phone Graph which each the node represents the phenomenon of the word, and its nan will determine the tendency of a phenomenon to move to another according to the node (3) State Graph is a graph that indicates conditions (4) Viterbi Algorithm A decoding method to re-encode the bits that have been encoded by convolutional code with the principle look for the most similar possible bit or can be called the maximum likelihood. The decoding process can be likened to comparing the received bit sequence with all possible coded bits. The most similar bits between the received sequences and the possible sequences of bits will be selected from the comparison process.

Sequence Diagram

The sequence diagram process will run this application by pressing open (UI) then it becomes Open (Play) then wait a few moments and the request question will return and it will open the page and display the incoming answer, and is marked with the appearance of the application request answer data has been completed

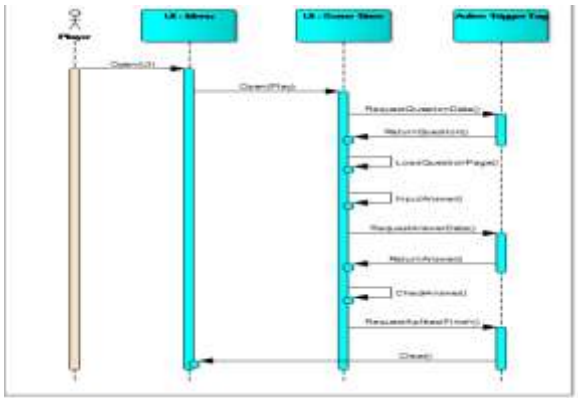

Figure 5. Application Sequence Diagram

Application Implementation

According to the analysis to the design and manufacture of applications, the final result of this application is the application of English learning media using speech recognition technology can be run according to the targets that have been set previously.

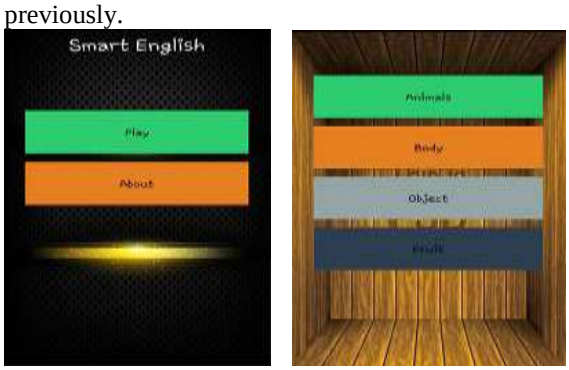

Figure 6. Application display

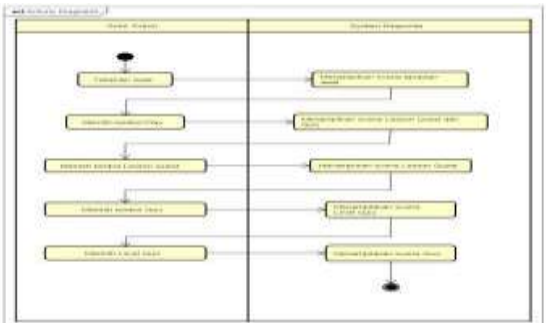

Figure 7 Activity Diagram Menu (Play)

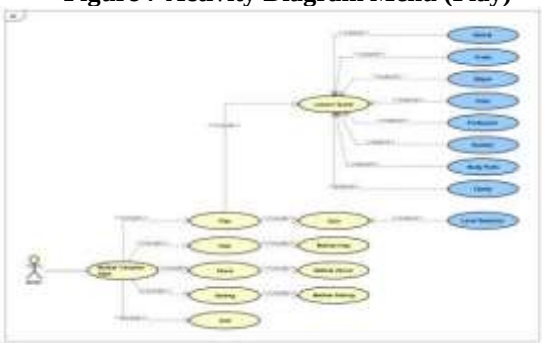

Figure 8 Use Case Diagram Application

At the concept stage, it begins by determining the purpose of making the application and determining its users. At this stage several methods need to be considered, among others, determining the purpose of the application, namely to introduce new learning methods, namely (1) Speech Recognition in the form of English learning applications for students at school (2) This application is used as an introduction medium for methods more interactive learning for students (3) Description of English learning applications for students using voice control or Speech Recognition (4) At this stage, detailed application specifications are made in an application design. This stage uses storyboards to describe a series of stories or descriptions of each scene so that it can be understood by users, by including all multimedia objects and links to other scenes (5) Storyboard is a visualization of ideas from the application to be built, so that it can provide an overview of the application that will be generated (6) Collection of material, at this stage the collection of teaching materials that will be presented in the learning media is carried out. These materials are in the form of learning materials, images and audio to support the creation of Speech Recognition applications (Styadi & Supriyono 2018; He & Tsai, 2021).

4. CONCLUSION

Based on the discussion of several previous explanations regarding the application of Speech recognition as an alternative media in studying English education, especially for students in the Serang Panjang State Senior High School, Subang Regency, the researchers can draw the following conclusions, english is a communication language that is often used between people the state orally and in writing in providing information in building speech recognition applications for students. Android-based and carried out with several steps: determining the design concept, collecting test materials, and distributing the application. The Speech recognition system can run well on Windows 10 applications and Android-based mobile phones and requires a stable internet connection so that speech recognition in these applications can run properly.

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