SMS READER ON ANDROID

Nur Hadisukmana[1], Yudhistira Gularso [2], Rusdianto Roestam[3],

Eko Syamsuddin Hasrito[4], R.B Wahyu[5]

(1)   President University, (Contact: nurhadisukmana@president.ac.id)
(2)   President University, (Contact: yudhistira.gularso@gmail.com)
(3)   President University, (Contact: rroestam@gmail.com)
(4)   President University, (Contact: ekosh2515@gmail.com)
(5)   President University, (Contact: rbw0101@gmail.com)

Abstract

This paper is basically walks through the development of "SMS Reader", an application that could read out the text messages which is aim to reduce traffic accident due the phone usage for texting while driving, help a very busy people that do not have time to just spent a minutes to just read the message, or disabled people that have difficulties to operate smartphone for reading text message. User can fully concentrate while focus on doing other thing. This application is built using speech library called Pocket Spinx, and equipped by character visualization interface.

Key words : *sms reader, android, mobile application, text-to-speach*

1. Introduction

In Indonesia, most of the people in huge city like Jakarta already so attached and rely on gadget or devices. It has a lot of function and utility that can maximize, give easier method, and quick access to do something. People also rely on the smartphone while driving, for finding the shortest route to get somewhere using the GPS based application. For doing daily activities, such checking mails or messages. But when the driver suddenly received a text from someone, people usually did a wrong thing by look right away and hold the phone; the other hand holding the steering wheel which is a dangerous act and can give a major consequences. The concentration on the road get distracted by reading the text on phone, not fully ready to perform reflect for sudden condition change on the road, and not safe for the other road user because this driver is not 100% aware on the road. Unfortunately, the awareness of the danger of reading text message while driving by holding and look to the phone is still low. People found it simple to just read and hold the phone while slowing down the ride. Or even ride as usual. Because people always did the same thing and nothing bad happened even it is dangereous for themselves and also other road user. In this work we have developed an application that can read incoming and received text, gives speech output, has character visualization, and it requires no internet connection.

2. Methodology

Figure 3.1 shows an overview of the workflow that constituted the developmental activity of the application.
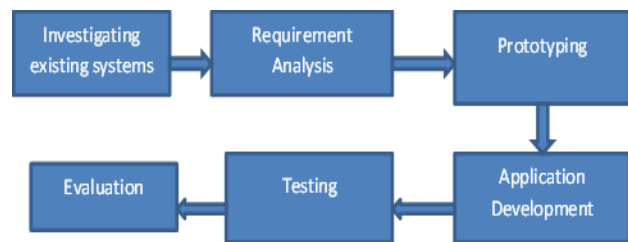

Figure 2.1 workflow representing tasks in sequential order

A literature study [1-3] was performed with a special focus in text-to-speech methodoloy and existing smartphone applications have been investigated in depth. The positives and negatives of existing system [4-5] were analyzed and based on the existing needs it extracted several features: SMS reader mode, offline word library, quick command suggestions,character visualization interface as shown in Table 2.1.

Table 2.1 Feature Comparison with the other related application

Features	SMS Reader	Utter!	Google Now	Siri
SMS Reader mode	V	X	X	X
Offline word library	V	V	V	X

Quick command Suggestio n	V	X	X	X
Character visualizati on interface	V	X	X	X
Selected phone utilization using speech	V	V	V	V

SMS Reader has similar function with the other application which is mentioned in Table 2.1, for example the capability to give command to phone like Utter!, or search what have been understood by system in the Internet like Google Now or Siri. What differentiate from those application that has been published before are the user can enjoy no lag experience when attempt to give command to the phone because SMS Reader use offline library that Google provided today for many words, with selected language. SMS Reader also has a unique mode called SMS Reader mode, which enable Text-To-Speech (TTS) capability to read incoming text messages to reduce distraction of the phone when driving. It can increase the safety while driving since the possible distraction that comes from device can be reduced by enabling SMS Reader mode in SMS Reader.

SMS Reader also developed and only could run in Android 4.1 and above, which is more stable and applied most updated technology. SMS Reader uses offline library system that allows the application to access the word library within the device that has been downloaded before.

3. Discussions

The features of the application is as follows:
- *Offline Word Library*

Offline word library offers a faster performance to search and match the correct word needed as the sound input received. This is the key features of the application that can operate even without internet connection because the library is saved inside the memory of the smartphone.
- *Text To Speech Capability*

This application can read and speak a text when the user are not in condition thatcan see the phone for doing texting or just want to know the content of the message. It will clearly speak it up for the user (English message).
- *SMS Reader Mode*

With this SMS Reader mode enabled, SMS Reader will give limitation to the command used to receive, user will not available to send message, but user can command the user to read the the received message during drive.
- *Character Visualization*

With Character visualization while operating, this application will give different user experience rather than any similar application. It will project and give real sensation of "assistant" to the user who have this application.

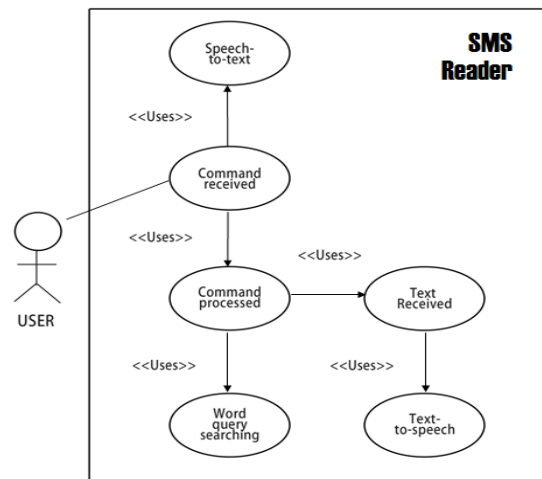The use-case diagram of SMS reader is shown in Figure 3.1

Figure 3.1 Use-case diagram of SMS Reader

In Command processed activity, the application will retrieve the speech. Then the speech will be processed and checked. If it is not right, the user needs to re-tell the command. If the command already correct, the user will get the desired action as the user commanded to the application and in word queary searching activity, the application will search and match the speech with the word in library. If it is matched, it gets back to be processed. If it is not match with any word in library, the application will will do nothing until the correct command has been said. While Text-to-speech activity starts whenever the user gives the command by tap the toggle button and received by the application. It will take over access over text messages, and say the word of that text messages if there any new message coming when this mode enabled. The user will listen the word, and system will read the message.

Class Diagram
SMS Reader provides the user a smart application that read out the message automatically when initiated before. In order to do so, the system distributed in several classes based on the functionalities to make higher efficiency.
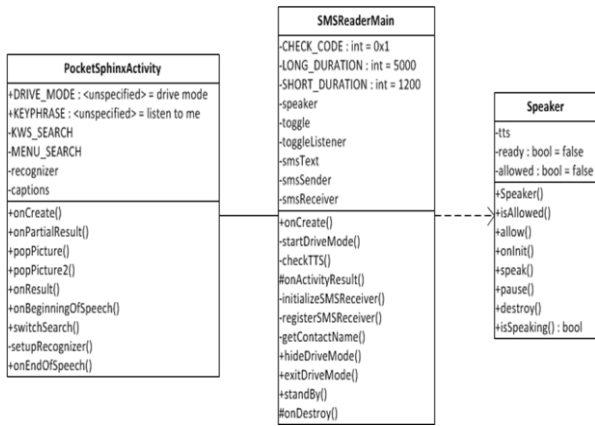
Figure 3.2 Class diagram

PocketSphinxActivity class is the first class to be called because it set as the main class. It listen to the word that user said and give word response to move to another activity and shows some visualization.

Figure 3.3 PocketSphinxActivity class

SMSReaderMain class is where user could listen to written sms without seeing the phones. In this class, it triggers by a toggle button to start. It also prepares the Google TTS engine to be initiated and running. Figure 3.4 shows all of the class methods.

Figure 3.4 SMSReaderMain Class

Speaker Class handles the Google TTS offline library that lies inside the phone. It gives some condition to SMSReaderMain before Speaker class could really read the incoming text.

User Interface

User interface design is created to show the output as the response from the system to the user. User Interface could also give and leave an impression to the user that interact with the application SMS Reader has only one main page, since the application process and interface running in background. But SMS Reader have the visualization character as an icon of this application. Her name is SMS Reader. She will pop out during several events of this application to give real virtual assistant that can depend on.

There are two sections of user interface development in this application, Initialization menu and SMS Reader menu. In initialization menu, user will be displayed by some text that tells the correct keyword to enable the application. User that already familiar with this could also hide the suggestion by simply touch the home button on the gadget or smartphone. And the program will run in background while still listening the word that user said. When the word succeed to be recognized by system, it will show character visualization to give look and feel experience for the user as shown in Figure 3.4. While SMS Reader menu will be displayed after the expected voice recognition in initialization menu was said correctly. SMS Reader menu will displayed the sender's name and text message to the user. In this menu also Google TTS engine will take over and read the received message out loud.
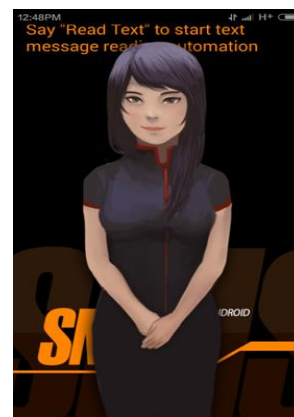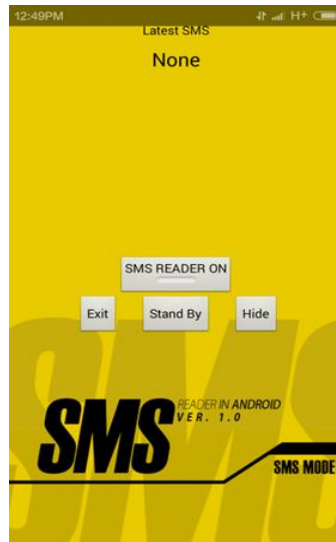

Figure 3.5 SMS Reader Initialization Menu Interface

Figure 3.6 SMS Reader Menu Interface

4. Conclusions

The application has successfully met its purposes, which is:

1. SMS Reader could run well on Android based phone and produce clear and correct sound output according to the message retrieved.
2. It also give a good performance in speech recognition in term of receiving command from the user and give fast response since using Pocket Sphinx for Android as additional library and service.
3. It helps people with limitation such physical, time, or in concentration in something else to get to know what inside the message
4. All function of the application can run without any internet connection or mobile data. So it just possible to operate this application anywhere.

The use of SMS Reader application in process of text-to-speech will give some advantages to the user, which is:

1. SMS Reader can assist people whom drive to read out new text messages.
2. SMS Reader can reduce the risk of road accident by using phone while driving because its preventing user to do touch interaction with phone by providing voice commands.
3. SMS Reader requires no internet connection, so that people that runs out of data package or has no internet connection still can use it and operates it.
4. SMS Reader gives fast response and give virtual interaction by showing iconic character called 'SMS Reader' so that gives new feel and impression to gadget user.

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