

SMART APPLICATION DEVELOPMENT RADIO ONLINE STREAMING USING SHOUTCAST API AND SPOTIFY API ON ANDROID PLATFORM

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ABSTRAK

Application of Smart Radio Online Streaming is an application that was built to meet the needs of the users of the online radio is still quite sought after by his audience. It is based on a survey conducted by the Nielsen's Radio Audience Measurement.

Nielsen Radio Audience Measurement is one of the institutions survey that provides world-class measurement analysis to meet the needs of its clients. Nielsen Radio Audience Measurement recorded in the year 2016 57% of the total radio audience comes from the Generation Z and Millennial's or the consumer of the future.

This is supported based on Appendix A-1 which contains a questionnaire that 57.1% of the 21 respondents stated that the difficulty in finding a channel on the radio, 85.7% of the 21 respondents agree/interested Viewer feature of the lyrics on the radio. The application will be built to provide song lyrics that are played when it's by utilizing the API and make use of the Spotify API to parse Shoutcast radio channel.

The results of the testing system, black box as well as alpha testing, this research can be concluded applications can meet the needs of the features song lyrics on the radio and can recommend a favorite channel for users.

Keyword: Android, Google Cloud Speech API, Spotify API, Shoutcast API, Radio Online Streaming.

1. INTRODUCTION

Radio Audience Measurement Nielsen noted that although the internet is growing by leaps and bounds in this quarter, does not mean that the range of the radio listeners will be low. Although the penetration of television media (96%), Outdoor Media (52%) and the Internet (40%) still high

However the media radio still is quite good at 38 percent in the third quarter of 2016. Although it is quite good on the radio are still experiencing problems of application in terms of features that is not following the trend of the present. This weekly penetration figures, shows that the media radio is still being heard by about 20 million consumers in Indonesia. Radio listeners in 11 cities in Indonesia that this at least Nielsen surveyed were spending an average time 139 minutes per day [1].

Smartphone use among today's society is very spacious. In various aspects of human life, the use of the smartphone has become one of the need because it can support communication between the communities. Smartphone as one of the development of the information communication technology can also help users to easily get information and details. With the development of information communication technology, people can communicate with each other and share information in many ways with no restricted areas and/or the scope of the information itself. Including one is information communication built by online radio streaming. As the results of a survey conducted by Nielsen online radio application against mobile phone is quite good in Figure 30% 38% [1] It is still possible to be improved with a few updates so that the radio be maintained its existence in the millennial's generation. This is supported based on Appendix A-1 which contains a questionnaire that 57.1% of the 21 respondents stated that the difficulty in finding a channel on the radio, 85.7% of the 21 respondents agree/interested Viewer feature of the lyrics on the radio.

Of the following issues will be made " **SMART APPLICATION DEVELOPMENT RADIO ONLINE STREAMING USING SHOUTCAST API AND SPOTIFY API ON ANDROID PLATFORM**" applications capable of delivering lyrics that are played when it's by utilizing the API as well as Spotify utilize the API to parse Shoutcast radio channel.

The goals achieved in this research are:

1. Simplify the radio user to listen to a song is being the trend through a feature channel recommendations.
2. Facilitate the user's music radio to see the lyrics of the song that is being played through a viewer feature lyrics.
3. Simplify radio users to display station/radio channel that is often heard through the features of your favorite stations.

1.1. Research Methodology

Research methods used in this study using two methods, i.e., methods of data collection and methods of software development.

1.1.1. Methods Of Data Collection

Methods used in the collection of data in this study are as follows:

- a. Study Of literature
Method of data collection by collecting reference such as journals, reference books and other reading that there is a relation to the title of the application.
- b. Interview
Interview is one of the ways of collecting data by conducting face-to-face directly by asking some questions that correspond to the user's online radio streaming.
- c. Questionnaire
The questionnaire is a method of collecting data by asking a few questions related systems/applications to be built.

1.1.2. Method of Software Development

Concerning the methods used in the process used in the stage of development of the software is to use the methods of Classical Life Cycle (CLC) or commonly referred to as Waterfall. Some of the waterfall process diagrams are as follows:

1. Stage of Communication (Project Initiation & Gathering) is a stage of communication with initializing a problem and identify the problems that exist in the current conditions such as conducting interviews to one user radio. It is aimed to know the subject matter of the running problems and what features that can meet the problem on a similar application.
2. Stages of Planning (Estimating, Scheduling, Tracking) is the stage of scheduling or target finished application smart radio online and checked against the function of the features that are being worked on.
3. Stage of Modeling (Analysis & Design) does is designing the data on table structure, designing a menu that is present on the system, describing the design of the interface for the design of the tools using Balsamic Mockups Android.
4. Stage of Construction (Code & Test) does is stir up codes to program using the Java programming language as well as testing the application is already running well or not.

5. The Deployment Phase (Delivery, Feedback) that is done is implementation of the software to the customer, software maintenance, software fixes periodically, evaluation software, and software development based on the feedback that is given so that the system can continue to run and developed in accordance with their functions [2].

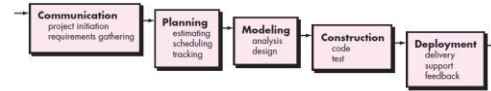


Figure 1 Waterfall Model Sommerville

2. THE CONTENT OF RESEARCH

2.1. Spotify API

Shoutcast API is one of cross platform software for streaming media through the internet. The software was developed by SPOTIFY AB in September 2008 and is available for free. This allows digital audio content especially in mp3 format or high efficiency advanced audio for broadcast to the media player via media player streaming-based as well as providing a high level of analysis that allows any developer able to access the SPOTIFY API to get the lyrics of the song that is playing[3].

2.2. Android

Android is a Linux-based operating system designed for mobile devices such as touch screen smartphones and tablet computers. Android was originally developed by Android Inc., with financial support from Google, who then bought it in 2005. This operating system is officially released in 2007, along with the founding of the Open Handset Alliance, a consortium of corporations hardware, software, and telecommunications which aims to promote open standards mobile device. First Android phone went on sale in October 2008. Android is an operating system with open source, and Google released the code under the Apache license. Code with an open source license and permissions in Android allows the software to be freely modified and distributed by device makers, wireless operators, and application developers. [4]

2.3. Shoutcast Api

Shoutcast API is one of cross platform software for streaming media through the internet. The software was developed by Nullsoft, and available for free. This allows digital audio content especially in mp3 format or high efficiency advanced audio for broadcast to media players through the internet radio station [5]

2.4. Apriori Algorithm

A priori algorithm is one of the classical data mining algorithms. Apriori algorithm used so that computers can learn the rules of the Association, looking for patterns of relationships between one or more items in a dataset.

A priori algorithm widely used in data transaction or commonly called market basket, for example a supermarket has a market basket, with the a priori algorithm, the owner of the supermarket can know purchase a consumer pattern, if a consumers buy items A, B, have a 50% possibility he will purchase the item C, this pattern is very the existence of significant data transactions during this time [6].

2.5. Analisis Masalah

Analysis of the problem is the problem description is found of the procedure or of the system that is currently running. Following the analysis of the problems of the existing procedures are described as follows:

1. The application of online radio against mobile phone is quite good in figure 38% is still experiencing some problems such as the lack of channel recommendations now playing track the trend at the time.
2. Based on Appendix A-1 which contains a questionnaire that 57.1% of the 21 respondents stated that the difficulty in finding a channel on the radio. This is because both conventional radio and radio online streaming does not provide smart search feature.
3. In addition 85.7% of the 21 respondents agree/interested Viewer feature of the lyrics on the radio. This is because at the moment the media music player already provides features such lyrics Viewer musixmatch, joox, Spotify, etc., resulting in strengthened the existence of radio users will load the viewer feature lyrics.

To overcome these constraints, first, it takes a smart online radio application development using the Shoutcast API to parse channel radio channel to feature the second song, recommendations for the implementation of a feature lyrics Viewer use the Spotify API to display the lyrics of the song that is being played.

2.6. Analysis Of The Running Procedures

Analysis of the running system describes how the occurrence of business processes and the activities of the system that is running on a conventional Radio is as follows:

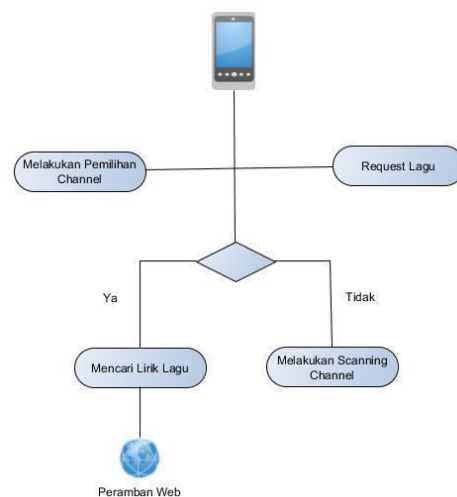


Figure 2 Diagrams Process That Is Being Walking

- Radio Channel selection process
In listening to radio users generally use mobile phone media. Users make the selection channel first.
- Process of searching/Scanning Radio Channel if the channel is not available then the user pressing the scan to search for an available channel.
- Process of searching for the lyrics of the song that is being Played
After getting the channel, users who want to know the lyrics of the song that is playing then it will search for the lyrics of the song through the browser/web search engines.
- Process Request favorite songs
If the user wants to listen to a song on favorite, the user must first request a song in advance to stations/radio channel in question. Then wait line play the song.

7. Android sends WMA audio files that have been recorded (MP4A format) against Google Cloudspeech Fire via the internet
8. The internet makes requests for the Google Cloud Speech API on Android
9. Google Cloud Speech Fire processes the conversion of MP4 files to text then sent to Android via the internet
10. internet sends text files to android over google cloud speech api
11. android makes a request to the web server to store the results of translational speech to text web server to give a response to android.

2.7. Arsitektur Sistem

Here is the system architecture to be built:

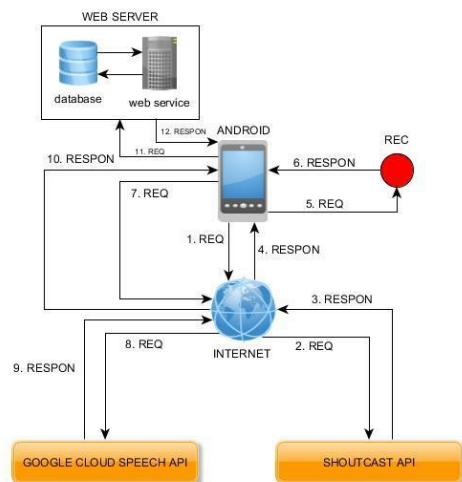


Figure 3 system architecture to be built

1. Android makes a request to Shoutcast Fire via the internet
2. The internet requests the shoutcast api on Android
3. Shoutcast Fire gives a response to Android via the internet in the form of a WMA file (audio streaming)
4. The internet responds to Android over Shoutcast API
5. Android performs recording of WMA files sent Shoutcast Fire via the internet
6. Android saves WMA audio files in MP4A format

2.8. Diagram Use Case

The following is a use case diagram for the smart radio online streaming application to be built:

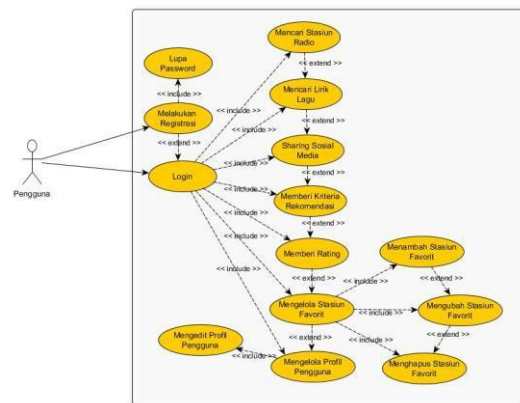


Figure 4 Use Case Diagram

2.9. Activity Diagram

Activity Diagrams are used to describe the process flow of a scenario that has been designed in each use case. With activity diagrams can be seen the interaction between actors with the system built. The activity diagrams in each use case are as follows:

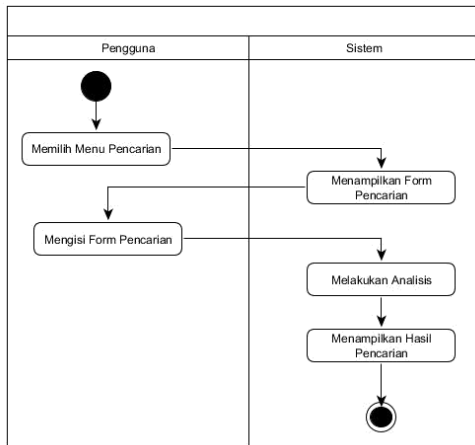


Figure 5 Activity Diagram Channel Search

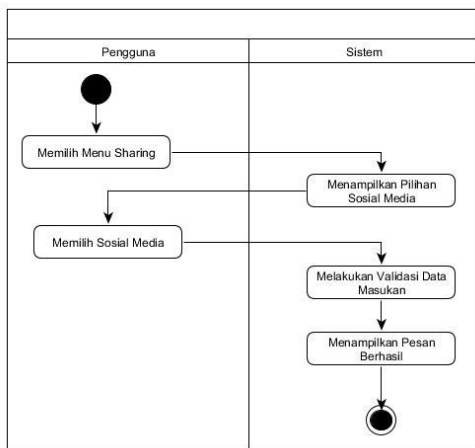


Figure 6 Activity Diagram Share Channel

2.10. Class Diagram

Class Diagrams describe the classes that will be created to build the system. Class Diagrams have attributes and methods. Next is the class diagram on the application that was built.

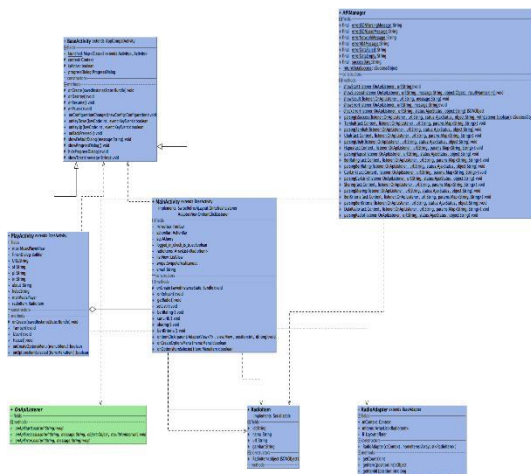


Figure 7 Class Diagram

2.11. Relation Table

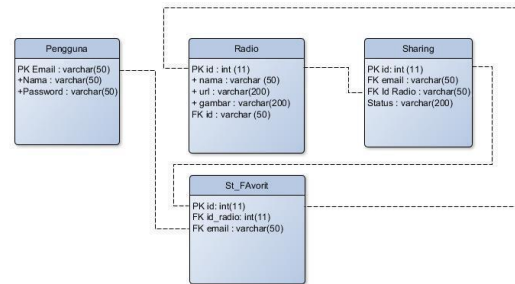


Figure 8 Relation Table

2.12. Structure Of Menu

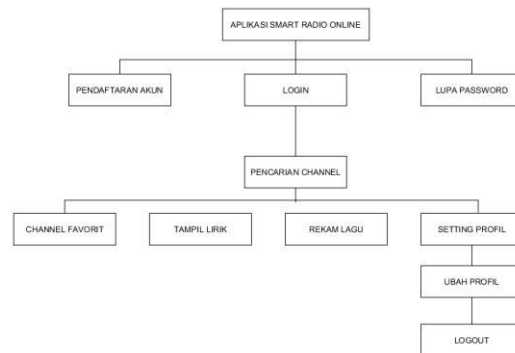


Figure 9 Structure Of Menu

2.13. Conclusion of Black Box Testing

Based on the results of testing with the sample test cases that have been conducted, it is concluded that the processes in the system are correct. Filtering process errors in the form of a user interface is quite maximal. Functional systems can produce the expected output.

2.14. Alpha Testing

Tabel 1 Alpha Testing

Kelas Uji	Poin Pengujian	Jenis Pengujian
Login	Input data login	Black Box
	Login validation	Black Box
Daftar	Input data Register	Black Box
	Push button Register	Black Box
Lupa Password	Input data lupa	Black Box
	Push button Kirim	Black Box
Cari Stasiun	Input Key Word	Black Box
	Push Button Cari	Black Box

Cari Lirik	Input kata kunci	<i>Black Box</i>
	Push button cari	<i>Black Box</i>
Sharing	Push button sharing	<i>Black Box</i>
Beri Rating	Input data rating	<i>Black Box</i>
	Push button simpan	<i>Black Box</i>
Tambah Favorit	Input data tambah	<i>Black Box</i>
	Push button tambah	<i>Black Box</i>
Ubah Favorit	Input Data Ubah	<i>Black Box</i>
	Push button ubah	<i>Black Box</i>
Hapus Favorit	Input Data hapus	<i>Black Box</i>
	Push button hapus	<i>Black Box</i>
Ubah Profil	Input Data Ubah	<i>Black Box</i>
	Push button ubah	<i>Black Box</i>
Rekomendasi	Push button rekomendasi	<i>Black Box</i>

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3. PENUTUP

3.1 Kesimpulan

Based on the results obtained in the research and preparation of this paper, conclusions can be drawn as follows:

1. Smart Radio Online Streaming application can help users to search song lyrics.
2. The Smart Radio Online Streaming application can help users listen to the radio without any interference with advertisements or radio jockeys.

3.2 Saran

The results of system testing are recommended to be developed in various forms of platforms other than Android.

Another suggestion is to add features other interesting things like scanning stations radio using longitude.

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