

A Design System for Radio Broadcasting Application with News Agent

I K. G. Sudiartha, P. M. Prihatini and I Made Purbhawa
Department of Electrical Engineering, Politeknik Negeri Bali, Badung-Bali, Indonesia

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Abstract: Along with the development of technology and information, social media develops through mobile device services. However, radio broadcasting media is still needed considering the needs of users in rural areas and areas with very minimal communication network coverage. In addition, there is also a need for vehicle drivers or machine operators who cannot access mobile equipment while carrying out activities but can still listen to both entertainment and information via broadcast radio. The role of radio broadcasting is very important to collect information from information agencies in the community and serve the delivery of information and entertainment for the community. Broadcasting radio operators need technical personnel as well as operators who manage music/songs and convey information orally. The operator's role is quite heavy when viewed from the time setting for 24 hours in one day. A support service that can assist in gathering information from agents in the community, managing broadcasting materials and conveying information in the form of voice is urgently needed. For that it can be realized with a computer-based application that can receive data in the form of text, convert text into sound and manage broadcasting both news and entertainment in the form of music/songs. This application is expected to overcome problems in collecting information, delivering information and entertainment services in the broadcasting world for 24 hours a day.

1 INTRODUCTION

Radio broadcasting has been used for a long time to convey information and as a means of entertainment for the community.

In line with the development of technology, especially computers, developing applications that can support the delivery of information.

Problems occur when collecting information sources that are relatively far away from broadcasting radio stations. In addition, it takes 24 hours to manage the time and broadcaster staff to serve the delivery of information through radio stations. For this reason, a broadcasting support application was made by utilizing computer technology.

There are several studies that have been done on data agents that are connected to web-based applications but have not been applied to radio broadcasting. In other studies, the use of web-based services has also been applied to the development of radio broadcasting by broadcasting voice recordings from broadcasters.

A system is needed to collect data from news agencies in text form and convert it into sound before being transmitted through broadcasting stations.

The system designed is to create a WEB-based application by implementing a news agent system. This news agent will send news to the web service in the form of text. The application will translate the information in the form of text into sound and manage the presentation of music and information in the form of sound before being distributed to radio transmitters. This process work automatic in operator function application. In addition to its role in delivering information, this application is also expected to assist in the preparation of reports.

2 RELATED WORK

Pelin Angin and Bharat Bhargava, researched by An Agent-based Optimization Framework for Mobile-Cloud Computing. Research that connects agent computers with server computers in the cloud as real-time data processing. The mobile-cloud computing paradigm, which involves collaboration between mobile and cloud resources.

A similar study was also conducted by I.E. Foukarakis, A.I. Kostaridis, C.G. Biniaris, D.I.

Kaklamani, and I.S. Venieris which implements multiple client computers with a web service through a server computer.

The research has implemented several agent computers and is connected to a web-based application but the application has not been carried out on radio broadcasting.

In a study by Berlin Chen, Hsin-min Wang, and Lin-shan Lee conducted a research entitled Retrieval Of Mandarin Broadcast News Using Spoken Queries. News broadcasting is done by taking from a database that stores voice data.

On the other hand, the use of text-to-speech converters has developed with applications in various fields, such as the use of reading electronic mail, reading text on a computer display, reading story scripts. But the use of a text to speech converter has not been applied to broadcast radio news in real-time from the database.

Many researches on the application of text to voice have been carried out, as written by Ayushi Trivedi, Navya Pant, Pinal Shah, Simran Sonik and Supriya Agrawal in a journal entitled Speech to text and text to speech recognition systems-A review. This study discusses the conversion from text to speech and vice versa from speech to text (speech recognition).

Based on the research, in this study developed a news collection system using agents that send information to web-based applications. News in text form is automatically converted to voice and then set up to be broadcast via radio broadcasting unit.

3 METHODOLOGY

SDLC is a methodology regarding software development, this model is known as the waterfall model or software life cycle. The principal stages of the model is illustrated in Figure 1 (Ian Sommerville, 2010).

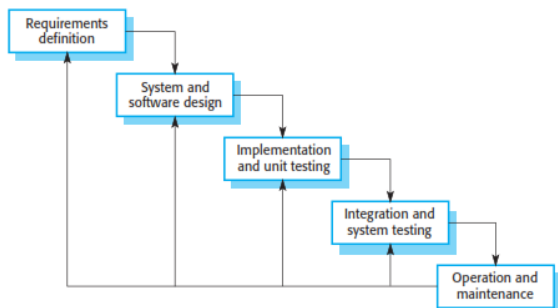


Figure 1: The Software Life cycle.

Five fundamental development activities:

1. *Requirements analysis and definition.* Consultation with system users is carried out to obtain designs according to objectives such as management of radio broadcasting, management of music and information, management of information sources and data related to radio broadcasting.
2. *System and software design* The System design includes hardware and software design and relationships. System architecture that supports radio broadcasting software performance.
3. *Implementation and unit testing.* Software design is realized as a set of programs or program units.
4. *Integration and system testing* The Application (individual program units or programs) are tested as a complete system. In addition to testing with localhost simulations, testing is also carried out with hosting as applied to radio broadcasting.
5. *Operation and maintenance* The system is installed and put into practical use.

The advantages of the waterfall model are that documentation is produced at each phase and that it fits with other engineering process models.

4 DESIGN SYSTEM

4.1 Design User and Data Flow

This radio broadcasting support system application involves several actors who are involved in it. Each actor has a role in this system. From the survey conducted, this application involved 3 main actors.

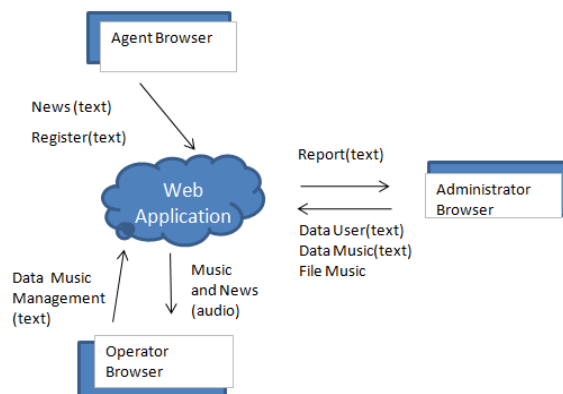


Figure 2: User and Data Flow Diagram.

The first actor is a news agent as a member of a radio broadcasting reporter group, the second is a station operator that operate station service application via browser, and the third is the management of a radio broadcasting company.

A news agent must register before join and distribute news to database. The information consist of date, news in data text format and agent identity. Agents can send news in the form of text to the database by logging in as an agent.

Operator is the person in charge of operating the system at a broadcasting radio station. The main task is to manage music and make sure the computer is connected to the radio transmitter. Audio output from computer is transmitted via a radio transmitter.

Administrator can create report for all activity around radio broadcasting company, manage data music and manage user account in radio broadcasting support application.

Application User and Data flow can show in figure 2. Data from the agent's browser to the broadcasting radio service application in the form of text data and store in database.

The operator manages music playback in the form of text data and receives audio data to be forwarded to the radio transmitter.

All management of user data, music data and report data is handled by the Administrator.

4.2 Architecture System

System architecture describes equipment or units and equipment relationships in broadcast radio service applications.

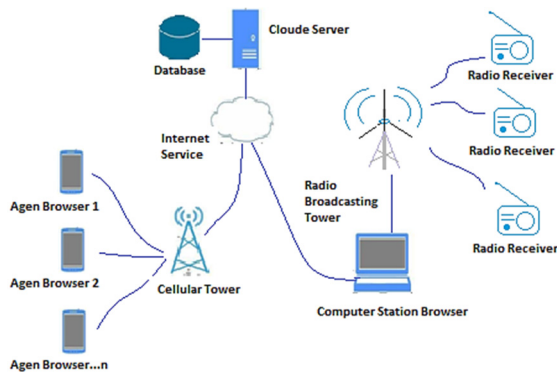


Figure 3: Radio Broadcasting Device Architecture.

This application involves equipment in the form of a computer supported by network facilities and internet services. This radio broadcasting support service application is placed in the cloud (hosting) as a web-based software service. This application

provides services for collecting and storing information from agents, processing text data into sound, management of music and news in voice form.

4.3 Use Case Diagram System

This section contains an explanation of who and what can be done in the system. There are three actors in this application, namely the Admin as an administrative manager with the main activity of Create Report, Data Management and User Management.

The second actor is the Operator, which is the person in charge of running the application at the broadcasting radio station. The Operator activity is Operation Management and Personal Data Registration.

The third actor is the Agent, whose activity is Sending News and Personal Data Registration. They find information and use web application to sending data from their own device to database in cloud. News Agent serves as a collector of information scattered in several places so that it can cover the broadcasting area. Use Case Diagram System can be seen in Figure 4.

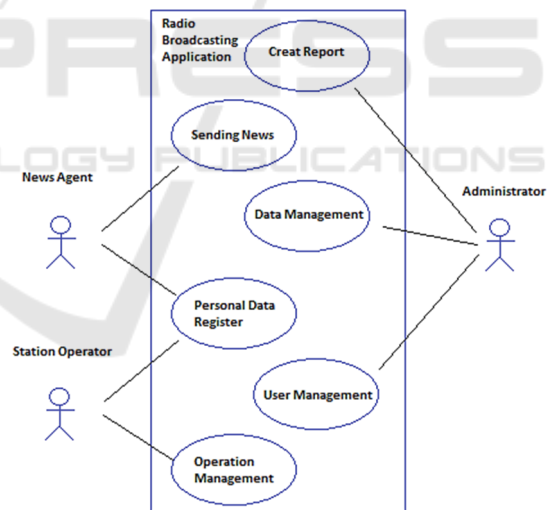


Figure 4: Use Case Diagram System.

4.4 Information Management Architecture

This section contains the mechanism for collecting information in the community through scattered news agents and sending news through web-based digital services.

Information in the form of text and stored in the database is converted into news in the form of sound

and then managed and combined with music before being transmitted through broadcast radio transmitters. An explanation of the application unit and information can be seen in Figure 5.

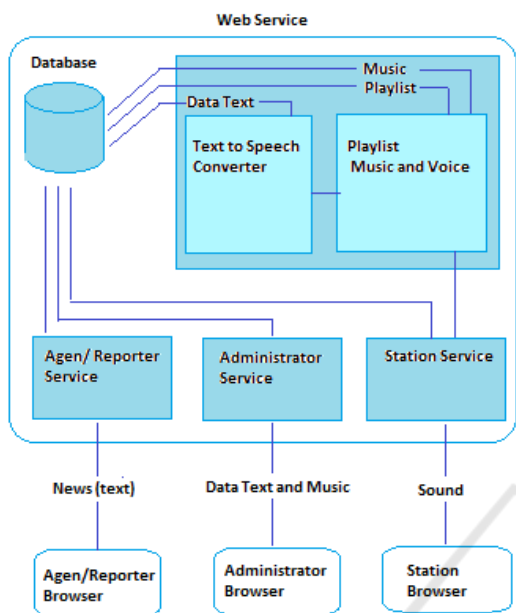


Figure 5: Information Management Architecture.

All data processing is carried out on a web-based application and news storage from the agent browser is in the form of text.

4.5 Result and Discussion

The design is implemented using the PHP and Java Script programming languages with layout settings using CSS.

Functional testing of the application includes sending data through the agent browser, setting music on the operator's browser, converting news in form of text to speech from the database automatically by the system and administrator browser can making company reports. Tests were also carried out on the suitability of the music volume response to news broadcasting.

From the test results show in Figure 6, the response of the application to the data entered into the database can run well. News queue listings appear on the monitor of the operator's browser. According to the looping time setting, the data update will repeat every 10 seconds to retrieve new queue data from the database. the news queue is broadcast one by one in the order of the queue. Simultaneously with the delivery of news, updates are made to the status of the news in the database so that the news that has been broadcast is deleted from the news queue list.

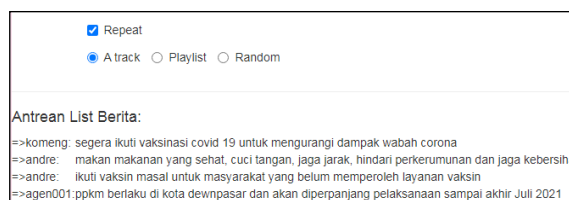


Figure 6: Test Results.

This application can be used to speed up and facilitate the collection of information from news agents and overcome broadcaster fatigue in reading information over a long period of time.

5 CONCLUSIONS

It can be concluded that the designed application is expected to improve information delivery services in terms of time and collection of information sources.

This application can also overcome the problems of management of operational time and broadcasters in carrying out their duties at broadcasting radio stations.

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