Implementation of Red5 Library for Preaching (Da’wah) live streaming application based on Android

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Abstract. Mobile-based technology makes it easy to share information. One of the information content that was shared was Preaching (Da’wah). Currently, Da’wah content is spread by mainstream streaming media and social media, so Da’wah content is mixed with other information. Another problem is the lack of verification of Da’wah content. Therefore, a mobile-based application using the Android platform is required to use the Red5 library that works for live streaming. Besides, the function of the Red5 Library is to provide video conferencing services on the android platform, so Da’wah content can be recorded and shared in real-time, fast, and can be accessed by more than 1 user at the same time.

1. Introduction

Preaching (Da’wah) is an activity that invites and calls on a person or group to believe and obey God [1]. Da’wah contains useful content in the form of messages or information about religion. Therefore, information or messages must be disseminated massively and in real time [2].

At present, there are two media used for da’wah. First, da’wah is done in places such as mosques and others, so the message or information delivered is limited to only those who attend. Second, the message and da’wah information is recorded, then the content is uploaded on social media or streaming media, so there is no reciprocity from those who get the message or information [3-5].

The rapid use of information technology can maximize the role of da’wah, by sending messages or information da’wah massively and real time, so that many people who get information da’wah, can be more extensive, real time and can be quickly conveyed [5,6].

The technology used can be web-based and mobile [5,7], because of the massive use of mobile phones, the application is made based on mobile using the Red5 Library [8]. Red5 library is used for video conference services on Android, so that this application can be accessed by more than 1 user, can be recorded easily and can be distributed quickly [9–13].

This paper systematically consists of 6 parts. First, an introduction that explains the research problem. Second, the research method used to answer the research questions. Third, application implementation is made. Fourth, the results of the study. Fifth, the conclusions obtained are related to research. Sixth, suggestions for further research.
2. Research methods
The mobile-based Da’wah application research method uses the Prototype method so that the stages of the application making process are carried out in accordance with the rules of Software Development Life Cycle (SDLC) [14,15]. The Prototyping rule is presented in Figure 1.

![Prototyping development cycle](image1)

**Figure 1.** Prototyping development cycle.

The application development phase uses the prototype method, starting with analyzing the system, system design, system testing, and system implementation. The prototyping phases are explained below:

2.1. System requirements analysis
The development of information systems requires investigation and analysis of the reasons for ideas to develop information systems [16]. The analysis was carried out to see the various components used by the current system including hardware, software, networks and human resources. The analysis also documents the activities of information systems including input, processing, output, storage and control [17,18].

![System architecture da’wah live streaming application](image2)

**Figure 2.** System architecture da’wah live streaming application.

2.2. System design
System design describes what the system must do to meet the needs. System design determines how the system will meet these objectives. The system design consists of design activities that produce functional specifications. The system design can be seen as an interface, data, and process design with the aim of producing specifications that match the product and user interface method. The display design of the Da’wah Live Streaming application is presented in Figure 3.
Figure 3. Live streaming preaching application interface design.

2.3. System testing
The purpose of system testing is to find errors that occur in the system and make system revisions. This stage is critical to ensure that the system meets the requirements.

2.4. Implementation
After the prototype is successful, at this stage it is the implementation of a system that is ready to operate and then the process of learning a new system and then comparing it with the existing system, evaluating it technically and operationally as well as the interaction of users, systems and information technology.

3. Implementation
The operation of the system can be done by testing the functions in the system, whether the application is in accordance with the design [19,20].

3.1. Login interface function
Implementation of the Login function is the interface that will first appear when the user opens the application. The implementation of the Login interface can be seen in Figure 4.

3.2. Registration interface function
Implementation of the Registration function is an interface that displays the user registration page. The implementation of the registration interface can be seen in Figure 5.

3.3. Broadcast interface function
Broadcast Implementation is an interface that displays when Broadcast starts. Implementation of the broadcast interface can be seen in Figure 6.

3.4. User interface function
Implementation of the User interface function displays broadcasts from broadcasters. Implementation of the User interface can be seen in Figure 7.
Figure 4. Interface log in da'wah live streaming application.

Figure 5. Interface registration application da'wah live streaming.

Figure 6. Interface broadcast application da'wah live streaming.

Figure 7. User interface da'wah live streaming application.

4. Testing results

Testing applications is an integral part of the application development process [21]. By running tests on applications consistently, we obtain an accuracy of verification, functional behavior, and usefulness of the application before releasing it to the public. Testing is done to quickly get input about failures, can detect failures early in the development cycle, safer factoring of code, optimize code without worrying
about regression, stable development speed and help minimize technical costs. The results of the live streaming da’wah application are presented in table 1.

### Table 1. Testing results da’wah live streaming application.

| No | Description               | Testing Procedure                  | Input                        | Output                        | Results Evaluation Criteria       | Result Obtained |
|----|---------------------------|-----------------------------------|------------------------------|------------------------------|-----------------------------------|-----------------|
| 1  | Login Function Testing    | • Open Application                | • Username                   | Enter the broadcast page     |                                   | Successful      |
|    |                           | • Email dan Password input        | • Password                   |                              |                                   |                 |
|    |                           | • Login Click                     |                              |                              |                                   |                 |
|    |                           | • Fill out the registration form  | • Email                      | Data saved successfully      |                                   | Successful      |
|    |                           | • Enter a username, email and password | • Password       |                              |                                   |                 |
|    |                           | • Click Register                  |                              |                              |                                   |                 |
| 2  | Testing registration form | Click Start                       | -                            | Featuring Camera Broadcast   |                                   | Successful      |
|    |                           |                                  |                              |                              |                                   |                 |
| 3  | Testing the broadcast function | Click Start                   | -                            | Display Broadcast            |                                   | Successful      |
|    |                           |                                  |                              |                              |                                   |                 |
| 4  | Watch Testing             | Click Start                       | -                            |                              |                                   |                 |

5. Conclusions

Development of Live Streaming Application Da’wah utilizes Live Streaming using the Red5 library. Red5 is able to produce good quality streaming video broadcasts. User bandwidth usage when using Red5 is smaller. Live streaming video applications developed using Red5 are in accordance with the needs of Da’wah live streaming. Live streaming video using Red5 can help to add the value of Da’wah because it can be done more than one user and the user can provide Da’wah feedback content.

6. Future works

Based on the quality of the application, the weaknesses and limitations of research, researchers can provide some suggestions for the use and development of applications, this application preaching Livestream can be used by sources which are trusted and limited to the public. Suggestions for future developers who will improve the quality of this application related to the available features include:

- Completing the comment feature so that viewers can ask questions.
- Provide report features so that da’wah content is in accordance with religious norms.
- Develop a multiplatform system.
- Adding reference features and recommendations of relevant da’wah material.

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