

Designing Shiyam Application: An Android-based Fasting Reminder

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Abstract— Indonesia is a country with Muslim majority. Muslims implement fasting as one of the essential Islamic pillars. Information regarding fasting is substantial for Muslims, especially warnings of imsak, sahur and iftar times. The integration of information related to fasting schedules and provisions in mobile devices with Android is a promising solution for Muslims. Designing the Shiyam application as the fasting reminder is great to perform. This application had been developed using the Waterfall model, emphasizing on the development of systematic and sequential information systems. The implementation of the Shiyam application that focuses on the aspect of fasting can provide detailed fasting-related information and provides warnings at the time of imsak, iftar, and sahur, which can help Muslims in carrying out their worship.

Keywords—Android, Fasting Reminder, Waterfall Model

I. INTRODUCTION

Fasting is the 3rd pillar in the Islamic pillars, both compulsory and sunnah fasting. Compulsory fasting consists of Ramadan and Nazar fasting. While sunnah fasting is more varied, such as Monday and Thursday fasting, Shawwal fasting, Arafat fasting, Ashura fasting, Sya'ban fasting, Dhulhijjah fasting and others [1]. Various types of fasting have different conditions and schedules, so information regarding the schedule and provisions of fasting needs to be known by Muslims.

Limited information or warnings when it comes to imsak, sahur and ifthar times especially when they are in a new place that is not reached by the mosque is considered to be a problem for Muslims who are fasting. One solution is to integrate information related to fasting schedules and provisions in mobile devices. Mobile phones or cellphones, mainly based on Android are one of the mobile devices that are owned by almost everyone. An amount of 92.54 % mobile operating system market share in Indonesia is Android. The high rate of Android users is accompanied by the development of Android-based applications [2]. In use, Android-based applications have fulfilled almost all the needs of the community, one of which includes a fasting schedule reminder application.

Some applications related to the fasting schedule have begun to be developed. Based on the research that developed a reminder application for Android-based mosque activity schedules. The schedule of activities includes the Al Qur'an Education Park (TPA) schedule, the committee's deliberations schedule, lecturers, mosque youth, recitation, and other activities such as fasting and community service [3]. Further research in [4] has designed the application "Smart Android for Moslem" based on the user's location. This application provides information about religious activities such as prayer, zikr, zakat, and fasting, which are

adjusted to the user's location. However, specific applications regarding information related to schedule reminders and fasting conditions are not yet available. Therefore, the design of Shiyam application as an Android fasting reminder needs to be done. The application development process has been supported using the Waterfall model, which emphasizes the development of systematic and sequential information systems [5].

II. MATERIAL AND METHODS

RESEARCH METHODS

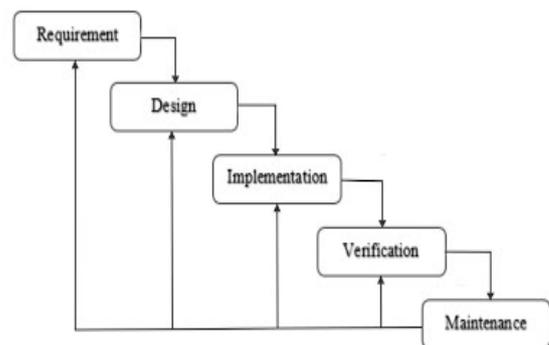


Fig. 1. Waterfall Methods

The research method applied in developing this application is the Waterfall method (Figure 1). The Waterfall method is a systematic and sequential model of information system development [5]. In building and developing applications using the Waterfall method, the information system development method used is systematic and sequential, meaning that each stage in this method is carried out sequentially and continuously [6].

A. Requirement Analysis

At this stage, data collection is carried out by conducting communication that aims to understand the software expected by the user and the limitations of the software. At this stage, the needs of the system are analyzed, starting from the functional requirements of the system and non-functional requirements of the system.

The need analysis process is the process of gathering data on information system requirements. The needs analysis process is carried out through a questionnaire (Figure 2) and comparative observation of similar applications. After observing, the process of identifying functional and non-functional requirements is carried out.

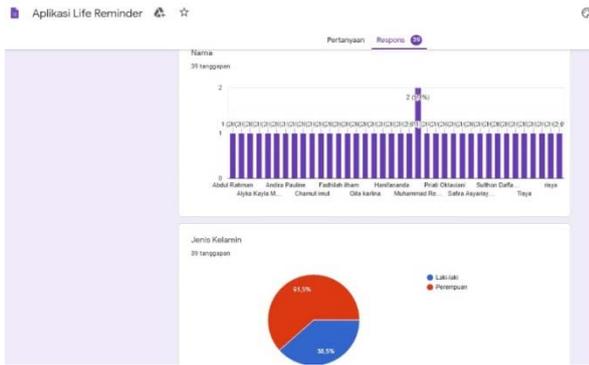


Fig. 2. Shiyam Application Questionnaire

Functional Requirements

Functional requirements contain any processes that will be carried out by the system. Functional requirements also contain information that must be present and generated by the system. These functions include:

- This application functions to provide detailed information.
- This application functions to schedule fasting time.
- This application functions to display a list of data reminders.
- This application equips with an audio alarm and location settings.

Non-functional Needs

Non-Functional Requirements are limitations of services or functions offered by the system. Non-functional requirements consist of applications that are User-friendly, have a saving of storage space, and have an operating system that supports various mobile phone specifications.

B. System Design

The design stage is an advanced stage of the analysis phase according to the system requirements to be made. The design includes software architecture and User Interface. The use of Unified Modeling Language (UML) as one of the tools or models for designing software development is intended to explain in more detail about the program design and database design. UML used in this application is the sequence diagram.

Flowchart diagram

Flowchart is a graphical depiction of the steps and sequence of procedures of a program [7]. The flowchart of Shiyam application is shown in Figure 3.

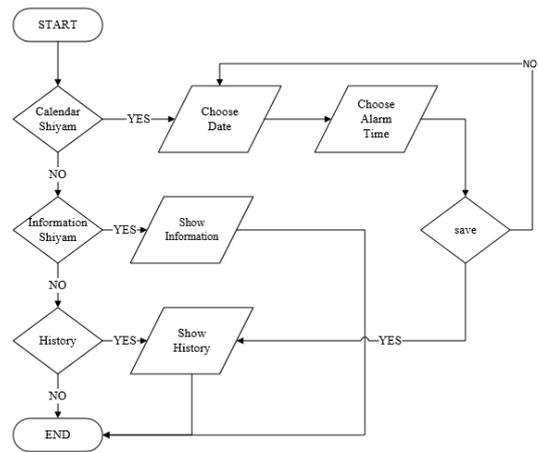


Fig. 3. Flowchart of Shiyam Application

Sequence Diagram

Sequence diagrams are interaction diagrams that emphasize the timing of messages [8]. The sequence diagram of calendar pages in Shiyam application is shown in Figure 4.

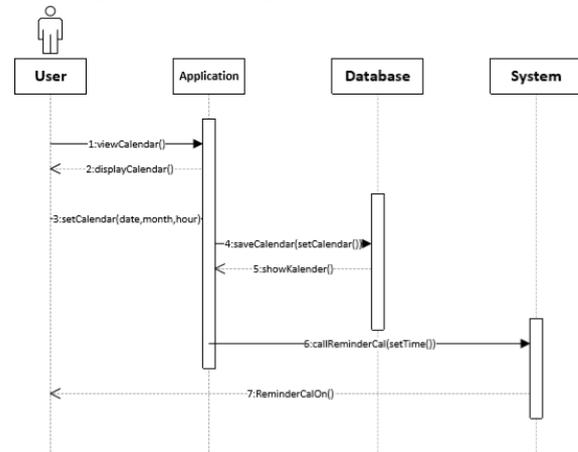


Fig. 4. Sequence Diagram of Calendar Pages

C. Implementation

At this stage, the design flowchart, UML, and User Interface are implemented on the lines of program code in the Java language on Android Studio.

D. Integration & Testing

The next stage is a unit test that has been developed in the implementation phase. Program Testing uses a Black box with the aim of making sure each part of the process flow is according to the set and ensure that input errors made by the user can be overcome by the system. The usability and easiness tests using a questionnaire were conducted to obtain the apps approval rate.

E. Operation & Maintenance

The final stage in the Waterfall model is process or maintenance. At this stage, the authors strive for the development and maintenance of systems that have been made related to hardware and software used.

III. RESULT AND DISCUSSION

Android Smartphone Specification

The minimum specifications of the smartphone to run Shiyam properly and smoothly are as follows:

- OS: Android OS, v.4.1.1 (Jelly Bean)
- RAM: 2 GB
- Processor: Quad-core 1.6 GHz Cortex-A9
- Camera: 8 MP
- Space Storage: 15.7 MB
- Screen Resolution: 720x1280-2560x1600

User Interface

Main Menu Page Implementation:

The first page that will appear after selecting the fasting reminder application is the main menu. There are menu choices named the Calendar Shiyam menu, Shiyam Information, and the History menu. As shown in Figure 5 below:



Fig. 5. Main Menu

Implementation of Calendar Menu Pages:

The calendar menu page will appear if the user selects the Calendar Shiyam menu on the main page. On this page, users can view prayer times according to their location and choose a day to add reminders. As shown in Figure 6 below:



Fig. 6. Calendar Menu Pages

Implementation of the Alarm Menu Page:

The alarm menu page will appear if the user has selected the plus button on the calendar menu page. On this page, as

shown in Figure 7, the user can choose when the reminder is set by pressing the drum image and selecting the save button. Following Figure 8, if the user has pressed the picture, a change in the picture indicates the reminder was successfully set.

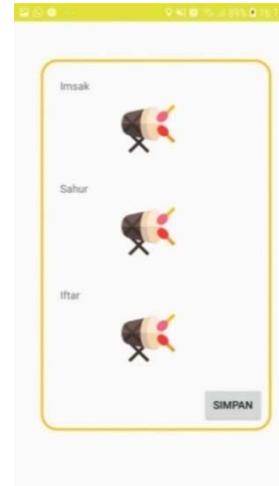


Fig. 7. Alarm Menu Page



Fig. 8. Examples of setting Imsak Times

Implementation of the Shiyam Information Menu Page:

The Shiyam Information Menu page will appear if the user selects the Shiyam Information menu on the main page. On this page, users can see the fasting types accompanied by a brief description of each fasting variation. As shown in Figure 9 below:



Fig. 9. Shiyam Information Menu Page

Implementation of the Shiyam Information Page:

The Shiyam Information page will appear if the user has selected a fasting type on the Shiyam Information Menu page. On this page, users can view fasting information in more detail. As shown in Figure 10 and Figure 11 below:



Fig. 10. Shiyam Information



Fig. 11. Shiyam Information Cont.

System Testing

The testing phase aims to ensure each part is according to the specified process flow and ensure that the system can overcome the user's error input. Tests conducted using a blackbox that has a perspective on functionality. The results of the test are shown in Table 1. The test is also applied to 10 respondents to obtain approval rate how usable and easy Shiyam application. Respondents consisted of 6 males and 4 females aged between 17-50 years. The questionnaire aimed to get information about the usability and easiness of Shiyam application. The results of the questionnaire showed that Shiyam application is useful and easy (Figure 12).

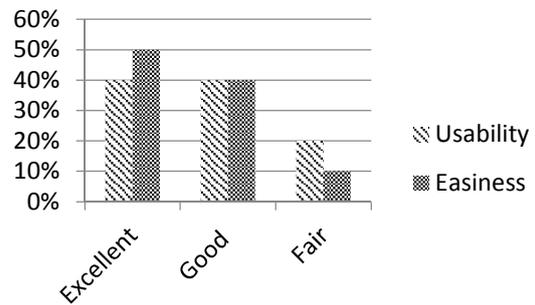
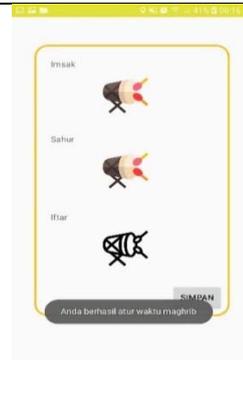


Fig 12. The Usability and Easiness Rate of Shiyam Application

TABLE I. BLACK BOX TESTING

Testing Scenarios	Test Case	Expected results	Test result	Conclusion
It provides access to the user's location when the application firstly opens.		The user's location display on the main page		Valid

<p>Select the reminder date on the Calendar Menu Page</p>		<p>Displays a message that the date is successfully selected</p>		<p>Valid</p>
<p>Press the iftar drum image on the Alarm Menu Page</p>		<p>There was a change in the drum picture and display the message indicating successful</p>		<p>Valid</p>

IV. CONCLUSION

Based on research that has been done by designing Shiyam applications, the following solutions can be found

1. The implementation of the Shiyam application which focuses on fasting, can provide detailed fasting-related information and provides warnings at the time of imsak, iftar and sahur that can help Muslims carry out their worship.
2. The use of the sequential and systematic Waterfall method in Shiyam application development is beneficial and easy to use.

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