

Building a Worship Demand Application with The Waterfall Method Using Flutter Framework at The Al-Muttaqin Mosque Suralaga, Indonesia

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Abstract:

With the rapid development of modern technology such as smartphones, it has positive and negative impacts in this modern era. The positive impact is easy access to information. Meanwhile, the negative impact is misuse of the smartphone itself, such as opening websites that are not suitable for viewing, one of which is addiction to internet games which makes you lazy about studying. Apart from that, there is also a significant problem, namely travelers and children or teenagers at the Al-Muttaqin Mosque in Suralaga who seem to have quite difficulty carrying religious guidance in the form of a book. To overcome this, an Android-based prayer guidance application was created. It is hoped that this can provide understanding for children and teenagers at the Al-Muttaqin Mosque in Suralaga. As a result, this application was built using the Flutter Framework and the Waterfall method which consists of the user needs analysis stage, namely analyzing what needs and features are needed when creating the application. The design stage is the system design stage using System Flowcharts, UML (Use Case, Class and Activity) diagrams. The implementation stage is the stage of implementing the UI/UX design into a programming language using Visual Studio Code. The final testing stage is the stage of testing the functionality of the application using black box testing and using usability. The results of black box testing show that all menus were successfully executed and the results of usability testing using a Likert scale were 84.8%. This shows that in terms of utility the application built is in the "Very Good" category.

Keywords: Android; Flutter; Worship Guide; Waterfall

1. Introduction

Advances in mobile phone operating systems are growing rapidly and can do many things. The operating system on cell phones is often used to run mobile applications as a means of entertainment and learning. One of the mobile operating systems that is currently widely used is Android because in terms of price and quality it is more affordable compared to other operating systems, apart from that, quite a few children and teenagers use it to download applications to complete their worship such as prayer guidance, dhikr, prayer and so on. In the Islamic religion, prayer is the worship with the highest position if we compare it with other existing worship, prayer is also the last loose bond in Islam.

The five daily obligatory prayers are a pillar or main foundation supporting a building. So if the pillar is weak or not strong, the building that is supporting it will collapse. Rasulullah Sallallahu 'Alaihi wa Sallam said that prayer is the foundation of the Islamic religion, and we as a people are prohibited from tearing down this foundation (HR. Baihaqi). Meanwhile, dhikr and prayer are also ways to get closer to Allah, where with dhikr and prayer a person can strengthen their relationship so that they feel closer to Him (Allah SWT).

In everyday life, worship is a benchmark for how to devote oneself to all activities or forms of work that aim to gain the blessing of Allah SWT. Apart from that, good worship must be equipped with correct understanding in its implementation, for this reason the application of worship guidance will make this easier. A guide to worship in the form of a book will require quite a large space in its presentation and today's teenagers mostly want something practical, so to anticipate this, the mobile-based Worship Guide Application with the Waterfall Method Using the Flutter Framework at the Al-Muttaqin Suralaga Mosque will be the best solution to the problem. This Android application was built using the Flutter Framework because it is easier for the developer of this application to understand and with the Waterfall method which has a one by one phase model so that it minimizes errors that will occur.

In another research entitled Making an Application for Learning the Pillars of Islam and a Collection of Prayers Based on Android, the aim is to create an application that contains information about the pillars of Islam with a prayer collection function, which is expected to be useful for people to learn about the pillars of Islam when creating an Android-based application. The ingredients in it. This application was created in the Java programming language with the Eclipse Indigo IDE (Rahman, 2022). Meanwhile (Ulum 2019), conducted research entitled Analysis of Applications for Memorizing Islamic Prayers Based on Android to Increase Interest in Learning for Santri Mandrasah Diniyah. An online-based prayer application that makes it easier to memorize prayers and this application was created using the Java programming language.

In 2019, Rahmawati also conducted research entitled Modeling the Android-Based Application of the Islamic World of Koran. to easily search for information about Islam, and can help us to study and deepen knowledge of the Islamic religion, and develop knowledge about designing Android-based applications. Apart from that, this application was created using the Java programming language (Rahmawati, 2019). Then in 2020, Ariansyah and Arif also carried out research entitled Design and Development of an Application for Mandatory Prayer Procedures According to the Sunnah of the Prophet Muhammad Saw Based on Android Using Adobe Flash Professional CS6 at SMA Negeri 1 Gunung Megang. Create an application for prayer procedures according to the Sunnah to facilitate teaching and learning activities that can be accessed via an Android smartphone and created using the Action Script 3.0 Adobe Flash CS6 programming language (Ariansyah, 2020). Meanwhile, other research created an Android-based morning and evening Zikr application to make it easier to perform dhikr without reading dhikr guide books and this application was built using the Java programming language (Rachmat, 2021).

2. Research Method

To support this research, the author uses the waterfall development model method. The author uses the waterfall method, because in this method you have to go through steps and step by step alternately (you cannot go straight to the next step) and run sequentially, so it is called a waterfall, like water. Meanwhile, the waterfall method consists of analysis, design, development, testing and maintenance. The selection of the Waterfall Model was carried out because the process was sequential and systematic, with the following stages (Wahyudi, E. 2023)

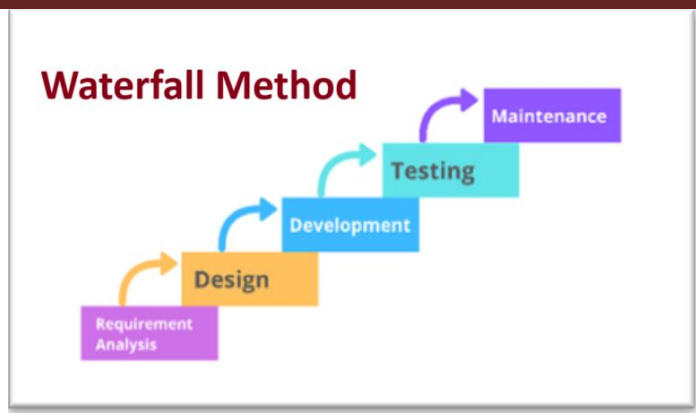


Figure 1. Waterfall Method

Referring to Figure 1 above, there are 5 stages in the waterfall method, namely; 1) Requirements Analysis: In this phase, software requirements are collected and identified in detail. This involves interaction with stakeholders to understand system requirements. 2) Design: Once the requirements are gathered, this phase involves designing the system architecture and detailed design of the software components (Wahyudi, E. 2023). 3) Development: In this phase, the software code is actually created based on the design that has been made previously. It involves writing code, unit testing, and component integration. 4) Testing: After implementation, the software is tested to ensure that it meets the requirements established in the requirements phase. Testing can include functional testing, performance testing, and so on. 5) Maintenance: After implementation, the software enters the maintenance phase where bug fixes, upgrades, and other routine maintenance are required (Wahyudi, E. 2020).

The waterfall method is suitable for projects that have stable and clear requirements from the start, and where changes in requirements tend to be minimal. However, its weakness is that it is less adaptable to changes in requirements that may arise during the development process (Wahyudi, E. 2024).

3. Results and Discussion

After carrying out various stages listed in the research method, the author succeeded in creating an Android system or application whose appearance can be seen in the following image:

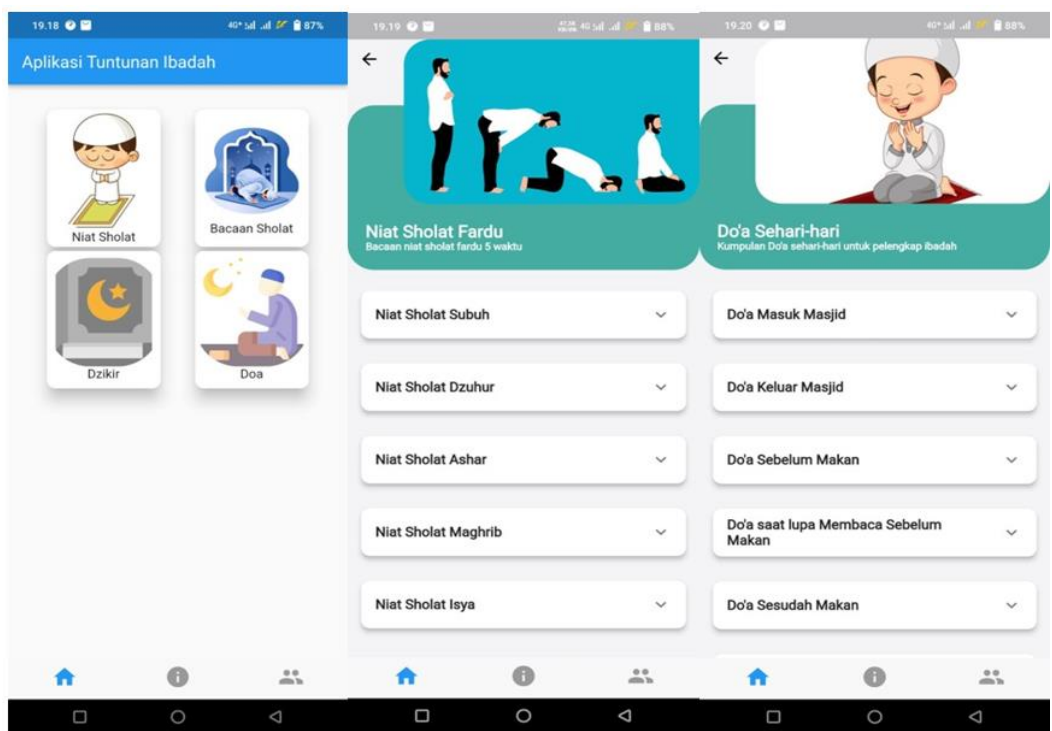


Figure 2. Worship Guidance Application Menu Display

In Figure 2 above you can see that there are 3 main views of this worship guidance application. This application consists of 4 main menus, namely; Prayer Intentions, Prayer Readings, Dhikr and Prayer. In the prayer intention menu there are 5 intention menus consisting of the intention for Subuh prayer, dzuhur prayer, Asr prayer, maghrib prayer and Isya prayer. Meanwhile, in the Prayer menu there are several prayers including the prayer for entering the mosque, prayer for leaving the mosque, prayer before eating, prayer when you forget to read the prayer before eating and prayer after eating.

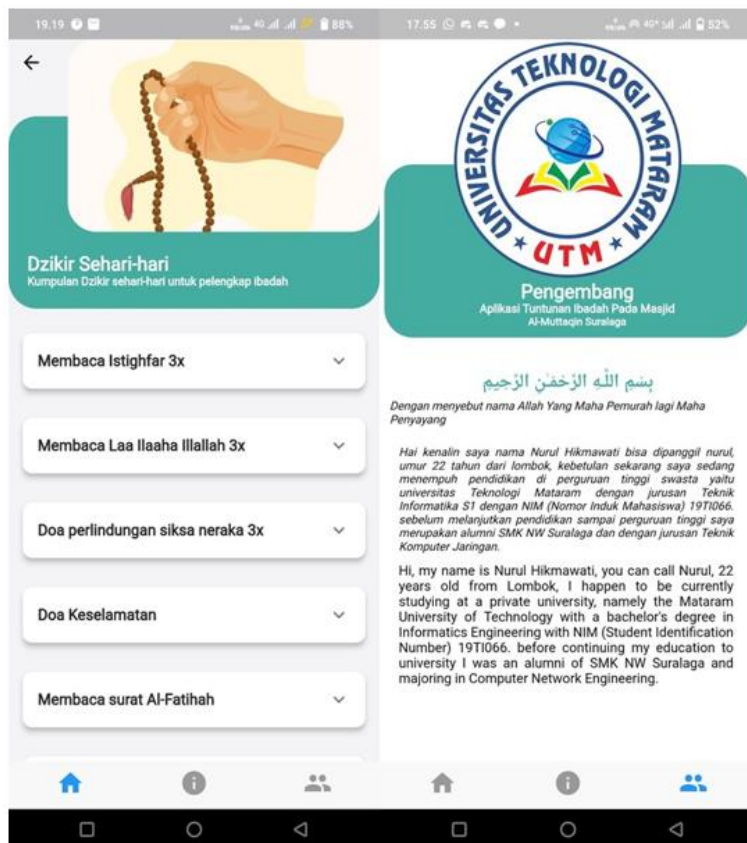


Figure 3. Display of the dhikr menu and developer information

Figure 3 shows the dhikr menu page and developer information. In the dhikr menu there are several dhikr displayed, namely reading istighfar, reading the sentence laa ilaaha illallah, prayer for protection from the torment of hell, prayer for salvation and surah al fatihah. Apart from that, there is also a menu related to developer information which can be seen in the image above.

3.1 System Functionality Testing

At this stage the system or application being built will be tested to see whether the system can run perfectly, apart from that this testing is carried out using the Black box method. The reason for using Black box is because Black box is a testing method that focuses more on the module specifications or functions being developed, both in terms of data structure, GUI errors, accessing data in the database, as well as performance errors so as to perfect the system without any errors occurring. So it is necessary to carry out Black box testing because most of this testing is carried out from the user's point of view (Putri Saman and Chanifah Indah Ratnasari, 2022). Thus, researchers prefer to use a black box rather than a white box. Apart from that, it also has a goal, namely to ensure that the application being developed has quality that meets the criteria applied and its functionality can run well before being used by the user. Meanwhile, White Box or what can be interpreted as "white box testing" is testing carried out to test software by analyzing and examining the internal structure and code of the software.

This functional testing section refers to the results of testing the Android-based worship guidance application with the aim of each page functioning properly. The following results from functionality testing using the Black box can be seen in the table below:

Table 1. Functionality Testing Results

Menu	Instrument	Results
Prayer Intention	When you select the prayer intention menu, the 5 times fardu prayer intention page will appear. And when you click the downward arrow on one of the prayer intentions, the dropdown will function and display the reading of the prayer intention.	Success
Prayer Reading	When you select the prayer reading menu, will the prayer reading page be displayed? And when you click on the down arrow on one of the prayer readings, the dropdown will work and can display the prayer reading.	Success
Pray	When you select the dhikr menu, the dhikr page will be displayed. And when you click the down arrow on one of the dhikr, the dropdown will function and can display the reading of that dhikr.	Success
Prayer	When you select the prayer menu, will the prayer page be displayed? And if you click on the down arrow on one of the prayers, the dropdown will function and display the prayer reading.	Success
Back Menu	Does the back arrow function on all menu pages, be it prayer intention pages, prayer readings, dhikr and prayer, where when the user clicks on the back arrow it will switch to the dashboard page display.	Success
Information Page	Can an information page be displayed when clicking the navbar button with the icon symbol (i)	Success
Development	Can the developer biodata page be displayed when clicking the navbar button with the people icon?	Success

3.2 Usability Testing

Usability testing aims to determine whether an application meets user needs or not. Usability testing is one way to find out whether users can easily use an application, how efficiently and effectively an application can help users achieve their goals and whether users are satisfied with the application they use (Hidayat, 2021). From the results of the research questionnaire using a Likert scale, the results were 84.8%, so it can be concluded that the application developed by the author is in the "Very Good" category from the results of the criteria interval table.

3.3 Discuss

Of the 5 (five) related studies above, the differences between the research carried out are in the form of frameworks, programming languages, and lists (menus) contained in the applications being built. Where the framework used by the author is in the form of flutter, dart as a programming language, and the list (menu) is in the form of Prayer Intentions, Prayer Readings, Dhikr and Prayers and also each reading is equipped with voice.

4. Conclusion

Based on the results of the research and testing that has been carried out, it can be concluded that the Android-based Worship Guidance Application has been successfully designed and has been completed. This application was built using the Flutter Framework and the Waterfall method which consists of the user needs analysis stage, namely analyzing what needs and features are needed when creating the application. The design stage is the system design stage using System Flowcharts, UML (Use Case, Class and Activity)

diagrams. The implementation stage is the stage of implementing the UI/UX design into a programming language using Visual Studio Code. The final testing stage is the stage of testing the functionality of the application using black box testing and using usability. The results of black box testing show that all menus were successfully executed and the results of usability testing using a Likert scale were 84.8%. This shows that in terms of utility the application built is in the "Very Good" category.

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