DESIGNING QURANIC APPLICATIONS AND PRAYER SCHEDULES WITH ALGORITHM METHOD KNUTH MORRIS PRATT ANDROID-BASED

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Abstract – *Reading the Qur'an is one of the obligations of a Muslim, because in the Qur'an there are guidelines for every human being to always walk on the path that Allah Almighty permits. Allah Almighty has promised in the Qur'an that anyone who reads the Qur'an will never get a loss but on the contrary, they will get double reward. The purpose of this research is to design the Qur'an Application through a communication tool called a smartphone. The result of this design to see the prayer schedule which consists of several menus and make it easier for the user of smartphobe to read the Qur'an and also to see the prayer schedule gradually.*

Keywords: Qur'an, Prayer Schedule, Knuth Morris Pratt Algorithm

I.   Introduction

1.1 Background

The Qur'an is Muslims' holy book that contains science, Islamic laws, and stories of earlier people. As a Muslim to study the Qur'an is an obligation. The Qur'an is derived in Arabic. In Indonesia, Islam is one of religions that has the highest number of followers compared to other religions. The Qur'an is a kalamullah revealed to the Prophet Muhammad SAW, as Muslims' holy book which is complete and comprehensive guideline for all human beings. The Qur'an introduces itself with various characteristics and traits. One of it's characteristic is the Qur'an authenticity is guaranteed by Allah swt, and it always maintained by Allah swt, until the end of life. [1].

The Holy Quran consists of 30 Juz, 114 surah and 6236 verses. With so many documents, searchs manually for letters, verses or words is quite difficult. Technological advances can be useful to overcome the problems. With computing techniques in searching letters, verses, or words in the Qur'an and prayer schedules for Muslims become easy, which must be done within a precision time. It is not a problem for muslims who are settling or traveling. But a new problem will comes up if a Muslim is traveling to other place, it is difficult to get information about the time

of prayer. Based on the problem above, the author wants to create a *mobile-based* on Qur'an application (Android) that is able to match and search for sura and verses which is related to the keywords as a centered of attention, as well as display the process of time and many comparisons needed in the searching process, and provides the prayer schedules to make it easier for Muslims to know the obligatory prayer time.

II. THEORETICAL BASIS

2.1   Application
Apply comes from the word *application* i.e. the object form of the verb *to apply,* in Indonesian means processor. In terms, a computer application is a subclass of computer software that uses a computer directly to perform the user wants. According to Indonesian Dictionary [2]. Application is the using of a system's design to process data uses the rules or provisions of a particular programming language. The application is a computer program created to perform and carry out specific tasks of the user.

2.2   Al-Qur'an
2.2.1   Al-Qur'an
The Qur'an is *kalamullah,* the word of Allah ta'ala. It is not human words. Nor the words jinn, evil or angel.

It does not come from the humans's, not poetry, not magic, nor as a product of contemplation or the result of human philosophical thought. According to the terms, the scholars have different opinion about definition to the Qur'an. Some says Qur'an is a miracle talks from Allah that passed down to the Prophet Muhammad SAW through the intermediary of Gabriel with its recitation and meaning from Allah Almighty, which is quoted mutawatir, reading Qur'an is worship, starting with surah al-Fatihah and ending with surah an-Nas[3][4].

2.2.2 The superiority of reading Qur'an

Among the other superiority of reading Qur'an that mentioned by asy Sheikh al Imam Abul Fadhl Abdurrahman bin Ahmad bin al Hasan ar Roziy al Muqri' in his book "Fadho'ilul Qur'an are :

1. The primacy of the Qur'an over other words.
2. The Qur'an is more beloved by Allah Almighty than what ever things in the heavens and the earth.
3. The Qur'an is a light in the midst of darkness.
4. Ahlul Al-Qur'an is the family of Allah Almighty.
5. Those who read Qur'an are the best human.

2.3. Prayer Time

The hadith that explains the prayer time is as follows: Jubir bin Abdullah r.a said; had come to the Prophet SAW. Gabriel as. Then said to him, get up! then pray, and then the Prophet prayed when the sun slipped. Then he came to Prophet again at the time of ashar pray and said: get up and pray! Then the Prophet prayed ashar in the shadow as tall as him. Then he came again to the Prophet in magrib time and then said; get up and pray, then the Prophet prays maghrib at sunset.

2.4 Android

Android is an operating system for mobile phones based on Linux. Android provides an open *platform* for developers to create their own apps that can used by variety of mobile devices. In the beginning, Google Inc. bought Android Inc., as a newcomer in making software for mobile phones. Then to develop the Android, it was formed *Open Handset Alliance*, a consortium of 34 hardware, software, and telecommunications companies including Google, HTC, Intel, Motorola, Qualcomm, TMobile, and NVidia[5]

2.5 SDK (*Software Development Kit*)

SDK (*Software Development Kit*) is a *tool* needed to develop applications based on android using the java programming language. At this time the SDK has become a tool and *Application Programming Interface (API)* to develope android-based applications.

The SDK can be downloaded on its' official website, namely: http://www.developer.android.com/. The SDK is free and clear to distribute because android is *open source*[6][7].

2.6 ADT (*Android Development Tools*)

Android Development Tools (ADT) is a plug-in designed for the Eclipse IDE that gives us the ease for developing Android applications[8].

2.7 AVD (*Android Virtual Device*)

Android *Virtual Device* is an emulator used to design the Android application programs. AVDs can be configured to operate a wide variety of installed versions of Android[9].

2.8 Basic4Android (B4A)

Basic Android is a simple*, powerful development tool* to build Android applications. The Basic4Android language is similar to the Visual Basic language with additional support for objects. The Android application (APK) compiled by Basic4Android is a native/genuine Android application and there is no *extra runtime* like in Visual Basic which dependents the msvbvm60 file etc, for sure the application compiled by Basic4Android is *No Dependencies* (not file dependency by others). The Basic4Android IDE only focuses on Android. Basic4Android development includes a GUI designer for powerful Android applications with Built-in support for multiple screens and orientations, and no more complicated in writing XML.

2.9 JDK (*Java Development Kit*)

Java *Development Kit* (JDK) is a product developed from Oracle aimed at Java *developers*. Since Java was introduced, the JDK has been the most frequently used *Java Software Development* Kit (SDK) [10].

2.10 Bahasa Pemrograman Basic

The Basic language is one of the high-level computer languages, because the Basic language is oriented towards the problems that the computer must be solved. A problem-oriented computer language is easier to learn, because the command uses are taken from familiar English. Besides, that the language is not too tied up a certain brand of computer. The BASIC language was created with the main purpose of being a layman's language as an intermediate medium between users interacting directly with computers. BASIC stands for *Beginner's All purpose Symbolic Instruction Code*. The creator of the Basic language was John G. Kemeny, professor of Darthmounth College and Thomas E. Kurtz in 1960[11][12].

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III. METHODOLGY OF RESEARCH

The research method consists of designing *Use Case Diagrams*, Class Diagrams, *Activity Diagrams*, *Flowcharts*, and designing database structures.

3.1 Use Case Diagram

Use Case diagram is a scenario description of the interaction between the user and the system. Us*e case diagram* illustrates the relationship between a user and the activities can do with the application.
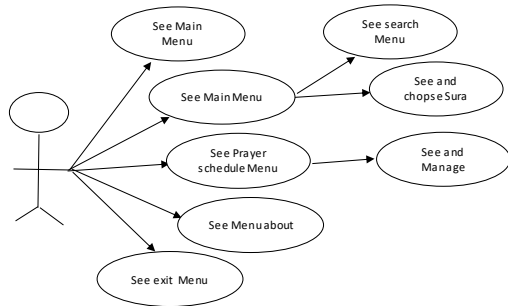
Figure 1. Use Case Diagram

The use case diagram in figure 1. above illustrates how the interaction between the user and the android-based Qur'an application will be designed and what menus are contained in the application.

3,2 Activity Diagram

Activity Diagram is a graphical representation of all stages of a workflow contains activity, action choices, iterations and results from those activities. The diagram can be used to describe business' process and operational workflows in step-by-step manner of the components of a system. The activity diagram of this system is as follows:
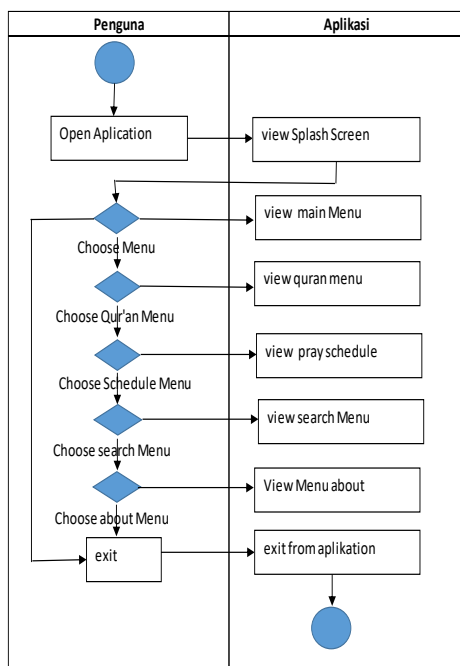
Figure 2. *Activity Diagram*

3.3 Database Design

The design stage of this database has relationships between entities and table design as a support system to be created.

3.4 Entity Relantionship Diagram

Database *design* in the system is the most important thing in *database* design and it can be described by *Entity Relationship Diagram* (ERD) as shown in the following diagram image:
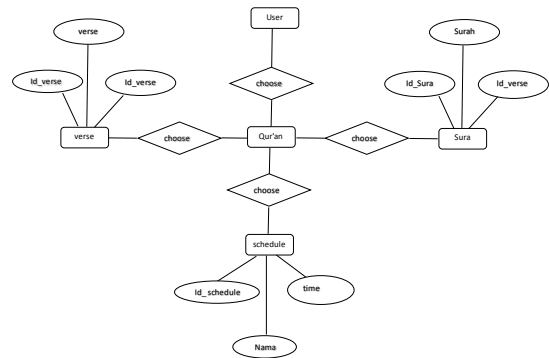
Figure 4. *Entity Relation Diagram (ERD)*

3.5 Interface Design

Interface design is an important aspect of application design, because it is related to the appearance and interaction that makes the user use it easier .The interface design on this system is as follows:
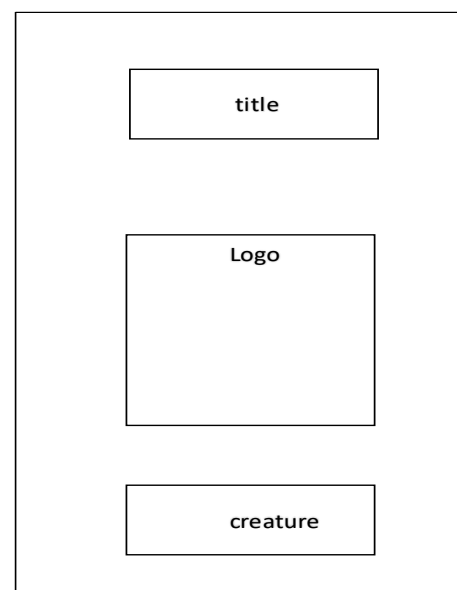
1. Design Interface Form Splash

Figure 5. Design interface Form Splash
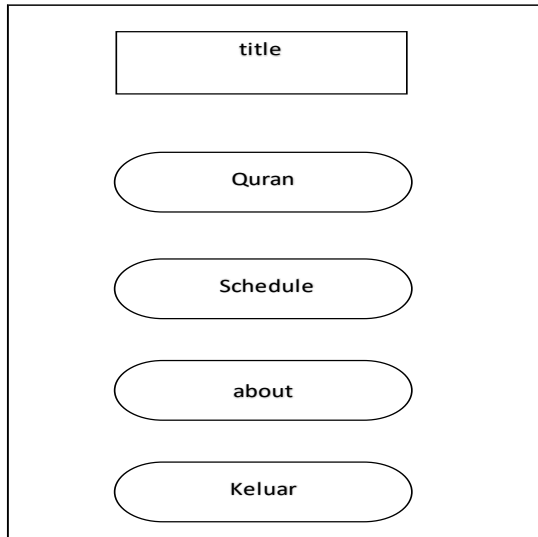
2. Design interface Main Form Menu

Figure 6. Design Interface Main Form Menu

3. Design interface Form Al-Qur'an
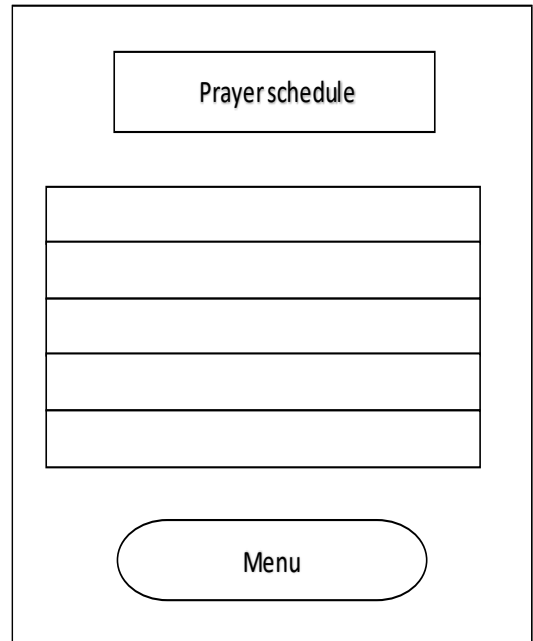

Figure 7. Design Interface Form Al-Qur'an

4. Design Interface Form Pray's time

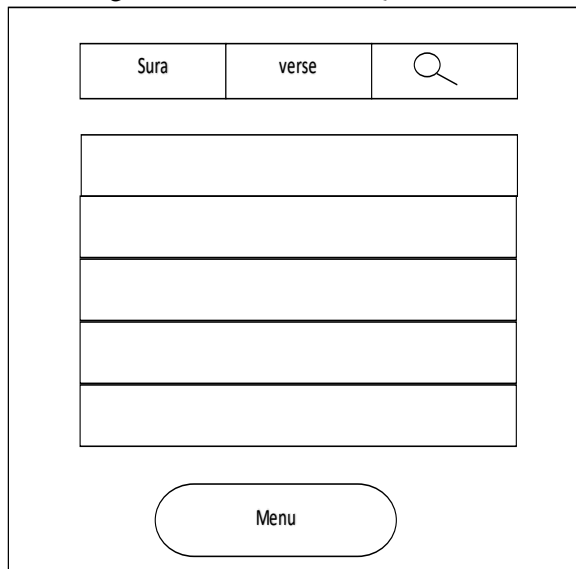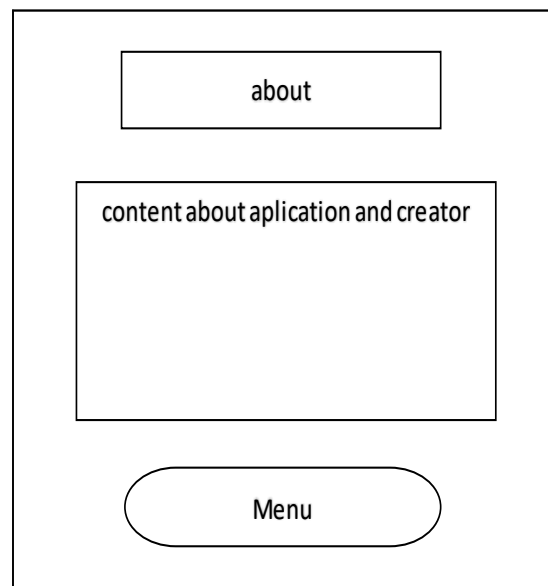Figure 8. Design Interface Form Pray's time

5. Design Interface Form About

Figure 9. Form Interface Design About

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IV. ANALYSIS AND DISCUSSION RESULT
4,1 ApplicationAnalysis of the Knuth Morris Pratt Algorithm

The Qur'an *mobile* application that will be designed use the *knuth morris pratt* algorithm as a solution in to solve the problems in searching the words, as well as the using of the book-shaped dictionary, the user take advantage of the way in presenting the words in alphabetical order, so that the users are greatly helped in finding sura. Therefore, in this *Qur'an* mobile application, the *knuth morris pratt* algorithm expected to solve the problem.

The Qur'an *mobile* application that will be designed will use the *knuth morris pratt* algorithm as a solution in solving word search problems, as well as in the use of book-shaped dictionaries, users take advantage of the way of presenting words in alphabetical order, so that users are greatly helped in finding surahs. Therefore, in this *Qur'an* mobile application, the *knuth morris pratt* algorithm is expected to solve the problem.

Example of using *the knuth morris pratt* algorithm in searching *pattern* in the text:
Text = POINT US THE STRAIGHT PATH
Pattern = US
Completion :

Figure 10. Completion of *knuth morris pratt* algorithm

Description: *Pattern* 1 is not match Text 1, then done 1 step to the right to the next *index*.

Gambar 11. Solving *knuth morris pratt* algorithm (2)

Description: *Pattern* 1 is not match Text 2, then take 1 step right toward the next index:

Figure 12. Solving the *knuth morris pratt* algorithm (3)

Description: *Pattern* 1 is not match Text 3, then 1step shift to the right to the next *index*.

Figure 13. Solving the *knuth morris pratt* algorithm (4)

Description: *Pattern* 1 is not match Text 4, *Pattern* 1 is not match Text 3, then 1step shift to the right to the next *index*.

Figure 14. Solving the *knuth morris pratt* algorithm(5)

Description: *Pattern* 1 is not match Text 5, then 1step shift to the right to the next *index*.

Figure 15. Solving the *knuth morris pratt algorithm* (6)

Description: *Pattern* 1 is not match Text 6, but *Pattern* 2 shift is not match text 7 then done 2 step shift to the right to the next *index*.

Figure 16 Solving *knuth morris pratt* algorithm(7)

Description : *Pattern* 1 matches texts , then the1step shift to the right to the next *index*.

Figure 17. Completion *the knuth morris pratt* algorithm (8)

Description: *Pattern* 1 matches Text 9, then a 1-step shift is made to the right towards the next *index*.

Figure 18 Solving the *knuth morris pratt* algorithm (9)

Description: *Patern* 1 matches Text 10, then 1-step shift is made to the right towards the next *index*.

Figure 19 Solving the *knuth morris pratt* algorithm (10)

Description: Pattern 1 to *Pattern* 4 matches Text 11 to Text 15. Then the *Pattern* is found and there is no more shifting.

Figure 20. Completion *the knuth morris pratt* algorithm (11)

4.2 Discussion Result

The results of the system implementation are based on the system design that has been made. The splash screen display will show an application splash screen image containing the application logo at the top of the display.

Figure 21. Splash Screen Display

In figure 21. the splash screen display will show an application splash screen image containing the application logo at the top of the display, research title, researcher name, major for 5 seconds. After 5 seconds, the main menu display will appear.

4.2.2 Main Menu Display

The main menu display contains the application logo at the top of the display and 3 main menus that can be selected by the user.

Figure 22. Main Menu Display

In figure 22. the main menu display is available 3 menu, namely the Qur'an menu, the Prayer Schedule menu, and the About this Application menu which can be selected by the user. Each selected menu will display the contents of these menu.

4.2.3 Search View

The search display is located in the Qur'an menu which is used to select and display the contents of the Qur'an.
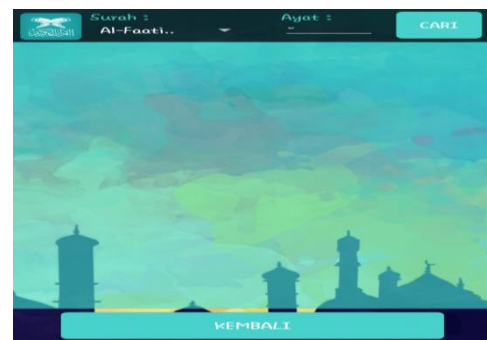

Figure 23. Search View

In 23. the search view users can select the sura and verse they want to see and will be display on the Qur'an menu. This search menu is contained in the Qur'an menu, because users must select the sura they want to see it firstly and then

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after selecting then the surah will display on the Qur'an menu.

4.2.4   Qur'an Menu Display

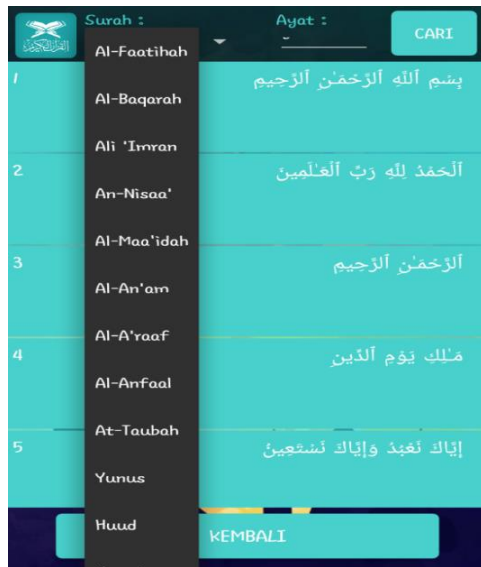The Qur'an menu display contains a search menu and a list of sura in the Qur'an.

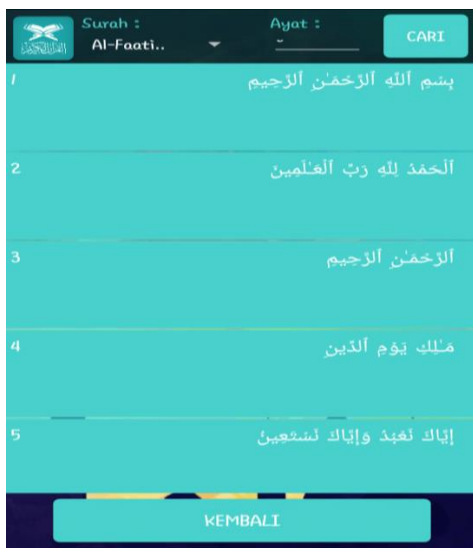Figure 24.4a Choose Sura of Qur'an

Figure 24.4b Dsiplay Menu of Qur'an

In figure 24.4a the user can select the sura wanted and will be displayed on the Qur'an menu according to the user's choice. In Figure 24.4b, the Koran menu display displays the sura that the user has previously selected

4.2.5 Prayer Schedule Menu Display

The Prayer Schedule menu display contains a schedule of obligatory prayer times, namely: subuh prayers, dzuhur prayers, ashar prayers, maghrib prayers and isya prayers.
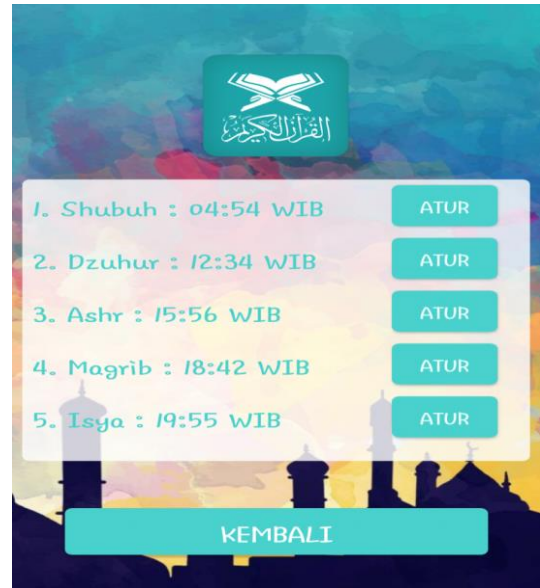

Figure 25.5a Prayer Schedule Menu Display

In figure 4.2.5 of the prayer schedule menu display, users can check the prayer schedule time, set the time and can install prayer schedule reminders.
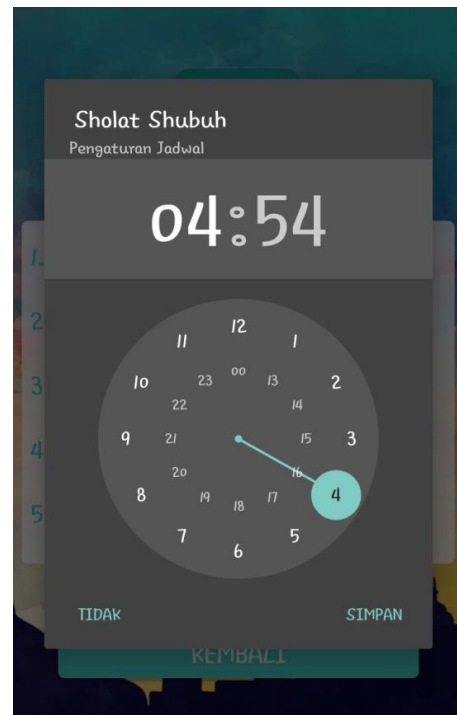

Figure 25.5b Prayer Schedule Alarm Display

In figure 25,5b of the prayer schedule alarm display, the user can set the prayer time according to the time of the place / area where the user is located. After settings are completed, the reminder/alarm will appear in the form of call to prayer according to the time set by the user.

4.2.6 About Menu View

The About Menu display contains information about this Qur'an application.

Figure 26 About Menu View

In figure 26, the menu about contains brief information about this Qur'an application.

V. CONCLUSSION

Based on the results of the research that has lead several conclusions can be drawn as follows:

1. The Android-based Qur'an application that has been designed is an application that runs on a smartphone that can help in terms of making it is easier for users who want to read the Qur'an and it is easy to carry anywhere.
2. This Android-based Qur'an application also has a Prayer Schedule feature that users can use to check prayer schedules and set prayer schedule reminders.
3. This Android-based Qur'an application can help users who want to find sura on the Qur'an more quickly and easily.

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