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Implementation of Rapid Application Development Model for the Development of Qur'an Tajweed Learning

Implementasi Model Rapid Application Development untuk Pengembangan Pembelajaran Tajwid Al-Qur'an

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Abstract

Shaykh Manna Al-Qahthan said that the Qur'an is the message of Allah SWT for all humankind. As a country with a majority Muslim population, 87.18% based on statistical data at the end of 2010 from the Central Statistics Agency. Data from research conducted by the Institute of Al-Qur'an Sciences in 2017 noted that around 65% of Indonesian Muslim communities are illiterate in the Qur'an. Learning tajweed Al-Qur'an by taking classes directly usually will take longer to master one material because it is carried out once a week. Information Technology can be utilized in this problem. Android-based application is one of them. The focus of this research is build a mobile application for learning Al-Qur'an recitation with the Nurul Bayan method using the Rapid Application Development system method. The results of the Blackbox test calculation on the Tajweed Learning Application are 100% and the results of the UAT test are. Based on the results of testing using the Blackbox Testing and User Acceptance Test methods, Android-based Tajweed Learning Applications can assist users in learning the basic theory of Al-Qur'an recitation with the Nurul Bayan method..

Keyword: Android, Application, Nurul Bayan, Rapid Application Development (RAD), Tajweed

Abstrak

Al-Qur'an merupakan kitab suci yang berbeda dengan kitab-kitab lain buatan manusia. Membaca Al-Qur'an harus mengikuti adab yang diajarkan oleh Rasulullah SAW dan dibaca dengan tartil. Data yang didapat dari riset yang dilakukan oleh Institut Ilmu Al-Qur'an pada tahun 2017 tercatat bahwasannya sekitar 65% masyarakat muslim Indonesia buta huruf Al-Qur'an. Belajar tajwid Al-Qur'an dengan mengikuti kelas secara tatap muka biasanya membutuhkan waktu yang lebih lama dalam menguasai satu materi untuk lanjut ketahap selanjutnya. Keterbatasan informasi dan waktu juga menjadi salah satu alasan seseorang tidak belajar ilmu tajwid Al-Qur'an. Teknologi Informasi dapat dimanfaatkan dalam permasalahan ini, Aplikasi berbasis android salah satunya. Fokus dari penelitian ini adalah membangun sebuah aplikasi pembelajaran tajwid Al-Qur'an dengan metode Nurul Bayan menggunakan metode pengembangan sistem Rapid Application Development (RAD). Hasil pengujian yang telah dilakukan menggunakan metode Blackbox Testing didapatkan nilai persentase 100% dan untuk hasil pengujian dari User Acceptance Test (UAT) pada User dalam menggunakan aplikasi didapatkan nilai persentase 98,5%. Berdasarkan hasil pengujian tersebut dapat disimpulkan bahwa Aplikasi Pembelajaran Tajwid Al-Qur'an berbasis Android dapat membantu User dalam belajar ilmu dasar tajwid Al-Qur'an dengan metode Nurul Bayan.

Kata Kunci: Android, Aplikasi, Rapid Application Development, Nurul Bayan, Tajwid

1. INTRODUCTION

Shaykh Manna Al-Qahthan said that the Qur'an is the message of Allah SWT for all humankind. As a country with a majority Muslim population, 87.18% based on statistical data at the end of 2010 from the Central Statistics Agency[1][2]. Data from research conducted by the Institute of Al-Qur'an Sciences in 2017 noted that around 65% of Indonesian Muslim communities are illiterate in the Qur'an. Tajweed means tahsin: repair or beautify[3]. In terms, it utters each letter from its exit, accompanied by giving the rights of each letter in the form of its characteristics and its Mustahak in the form of other tajweed laws such as Mad, Nun Sukun or

Tanwin, and Harokat[3]. Learning tajweed Al-Qur'an by taking classes directly usually will take longer to master one material because it is carried out once a week[4]. Studying the recitation of the Qur'an can be more optimal by combining technological advances and conventional methods[5]. Information Technology can be utilized in this problem. Android-based application is one of them. The ease of developing the Android Operating System benefits mobile application developers[6]. It is shown by the many android-based recitation applications that can be easily found on the Google Play Store. However, existing applications are still not maximal in helping users learn the science of recitation[7].

There are many methods of studying the science of recitation. One of them is the Nurul Bayan method. This method facilitates the intensive learning process of reading the Qur'an. It is because of learning the Nurul Bayan method by repeating spelling by reciting the law of recitation of tajweed directly and accompanying Matan Tuhfathul Athfal as a legal guide. Sheikh Isham Sayyid Muhammad Yusuf, one of the originators of the Nurul Bayan method, said that this method had been applied in many countries[8]. The application that will be developed later is a recitation learning application consisting of two main menus, Muqoddima and lessons. Each material is equipped with theory, practice, and test pages. Pictures and audio will support the discussion of each material. To be able to proceed to the discussion of the subsequent material, the user is required to be able to complete each question correctly in the previous material test so that the flow of discussion in this application is then continued. In 2015, there were 94% of smartphone users. This data is the result of research from Waiwai marketing.

According to Google's CEO (Larry Page in Nugroho 2012), there are currently approximately 250 million Android OS-based devices active, more than 700 thousand active daily[9]. Data collection in this study will be carried out at the Markaz Eljawwad El Azhari Foundation to study the Qur'an and Islamic Sciences. Ustadhah Hj founded this foundation. Dian Septiani, Lc. Dipl. She has held two lines of the history of Hafs 'An 'Ashim Thoriqoh Ash-Syaatibiyah. The method in the teaching process of tajweed at Markaz Eljawwad uses the Nurul Bayyan method. This Nurul Bayyan method will also be used in making applications. Many methods can be used in the development of an application[10]. Like the Sutopo method, the Sutopo method is an appropriate software development methodology for multimedia-based software development[11]. The RAD model is an approach that aims to shorten the time required in the traditional system development life cycle of designing and implementing an information system[12]. This study uses the RAD method. Based on research conducted by Noertjahyana (2002) states that the RAD method can reduce the possibility of errors [13]. Based on the previous background, a problem was formulated: how to design a mobile application for learning Al-Qur'an recitation using the RAD method to make it easier, more effective, and efficient for the community to learn the science of recitation of the Qur'an.

2. MATERIALS AND METHOD

2.1. Collecting Data Method

The flow of the research can be seen in Figure 1. In designing and building applications in this study, the authors collected data employing library research. The literature study was carried out at the data collection stage to add reference data to support the problems in this research. This method is done by collecting, reading, and studying books related to this research, namely the science of recitation. One is a book entitled Asy-Syafi'i Complete Tajweed by Sheikh Abu Ya'la Kurnaedi, Nurul Bayan and Fathurrohman Fii Ta'limil Qur'an by Sheikh Isham Yusuf and Practical Guidance on Tajweed Science by Ustadh Hardi Damri, Lc.

The observation method is also used in collecting the required data. Observations were made at the Markaz Eljawwad El Azhari Foundation to study the Qur'an and Islamic Sciences. At Markaz Eljawwad the method used in the teaching process of recitation of tajweed uses the Nurul Bayyan method. This Nurul Bayyan method will also be a guide in making applications.

2.2. System Development Method

The research methodology for the design and development of this application uses the Rapid Application Development system method. A software development model with a short processing time and still producing good quality is a characteristic of the RAD method[13]. A model that is an adaptation of the high-speed version of the Waterfall model[14]. The following are the stages in the RAD model:

1. Planning Terms
   In this phase, the researcher did the following:
   a. Looking for information about recitation.
   b. Identify application objectives.
   c. Determine the features to develop in the application.
   d. Hardware and Software Requirements to build applications.

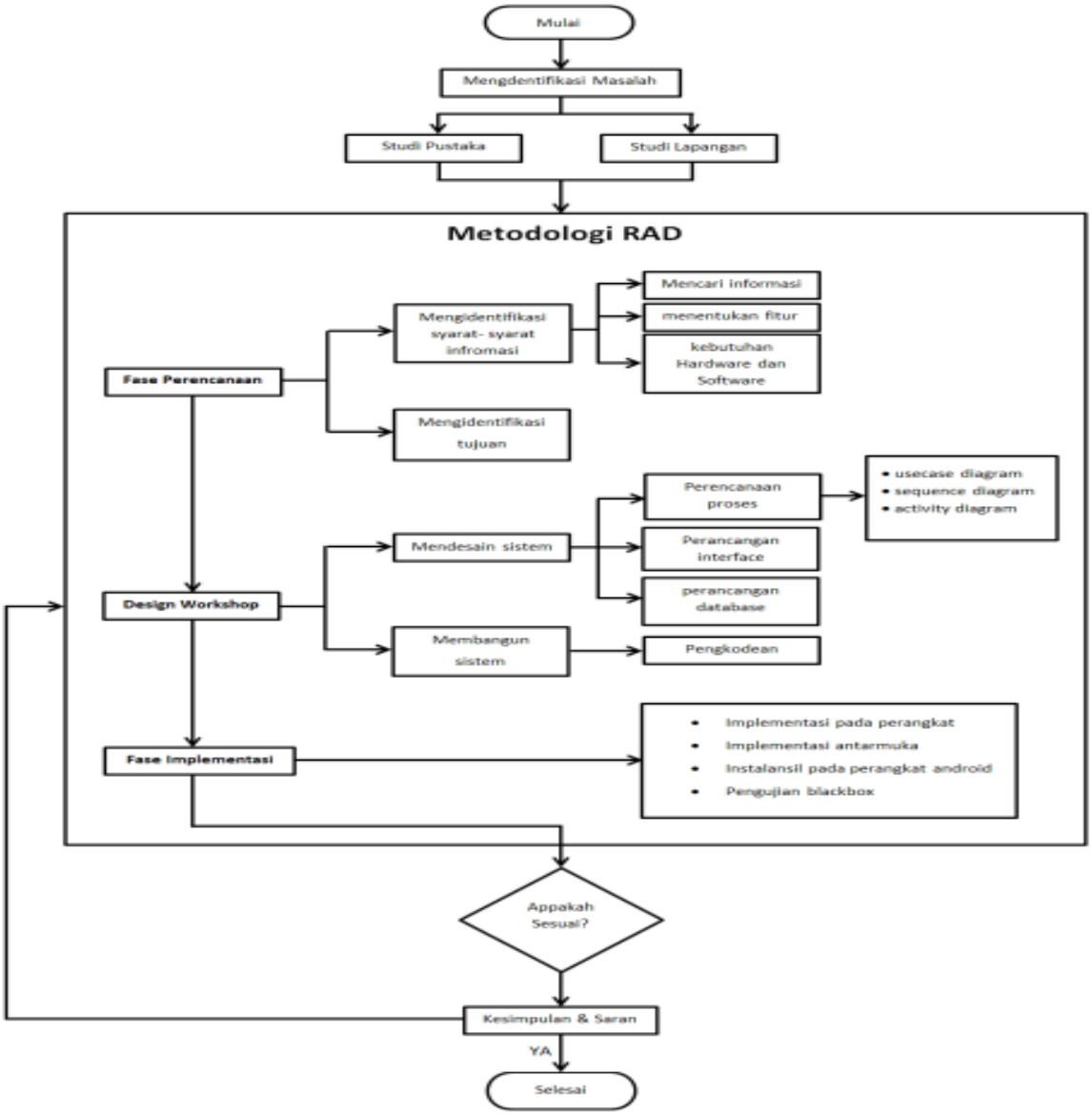

Figure 1. Research Methodology

2. System Design Stage
   At the system design stage, the researcher designs the application based on the research objectives and the problems encountered. This design phase the author divides into three stages, namely as follows:
   a. Design Stage
      In system or application design, four UML models are most effective in describing system design, namely Usecase Diagrams, Class Diagrams, Sequence Diagrams.

   b. Interface Design Phase
      1) Display an explanation of the recitation of the Qur'an
      2) Show the theory of recitation material
      3) Display examples of each recitation material
      4) Display a test for each recitation material
      5) Display a picture of the location of Makhorijul Letters
      6) Include audio for each practice of recitation material
      7) Show an explanation of learning methods, short motivation for learning tajweed, reading the Qur'an and memorizing the Qur'an.

3. Build system or Coding
   All designs made in the previous phase will be improved in this phase using the software. The software used by the researcher in this study includes Android Studio IDE. Android-SDK has

several sections such as Debugger, Libraries, Handset Emulator, documentation, code samples and tutorials9. If the system is suitable, implementation and testing will be carried out.

3. Build system or Coding
   The researcher performed the following stages in the implementation:
   a. Implementation of hardware and software.
   b. Implementation of the interface.
   c. Installation on an Android device.
   d. Application testing using Blackbox Testing and UAT methods.

3. RESULTS AND DISCUSSION

In the discussion of application design, several plans need to be designed. It begins with the design of the proposed new system and the system display's planning.

3.1. Usecase Diagram

Usecase Diagram can represent several paths of human interaction with the system, and each path is called a scenario1. The description of the proposed system can be seen in the form of a Usecase diagram, as shown in Figure 2.

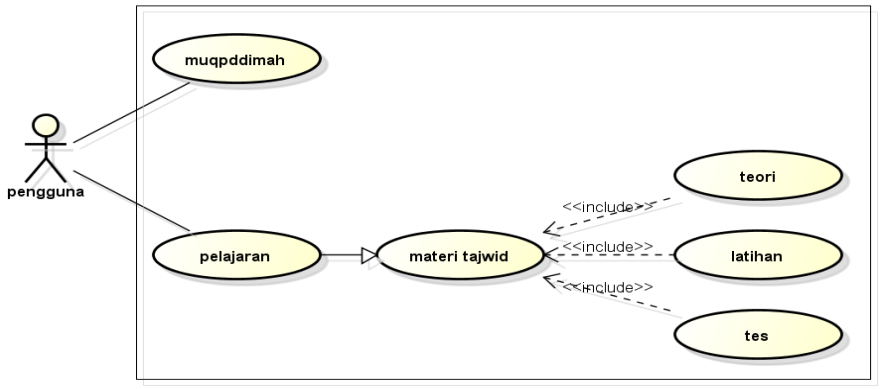

Figure 2. Usecase Diagram Of Application Design

Figure 2 illustrates the use case diagram of the Al-Qur'an recitation learning application. It consists of one user actor and six use cases, including muqadimah, lessons, and recitation material. The tajweed material contains theories related to macrojal letters, exercises and tests. The user must complete the test process individually in the test use case. Implementation of the interface is the result of the application design conducted previously. The following is an explanation of the interface display of the Android-based Tajweed Learning Application:

(a) (b) (c)

Figure 3. Interface

Figure 3(a) is the main page for users to open a recitation learning application. On the main page, there is a menu of muqoddimah and lessons. Figure 3(b) is the Muqoddimah page of the recitation learning

application. On the Muqoddimah page, there are Tajweed and Nurul Bayan menus and Figure 3(c) is the page of the recitation learning application lesson. On the lesson page, there is a Makhorijul Huruf menu and Waqof. The menu on the lesson page can be opened if the user can answer all the questions on the test page correctly. For example, the Harakat menu can be opened if the user can complete the Makhorijul Huruf test, the Character menu can be opened if the user can complete the Harokat test, and so on. The interface of the application test page can be seen in Figure 4.

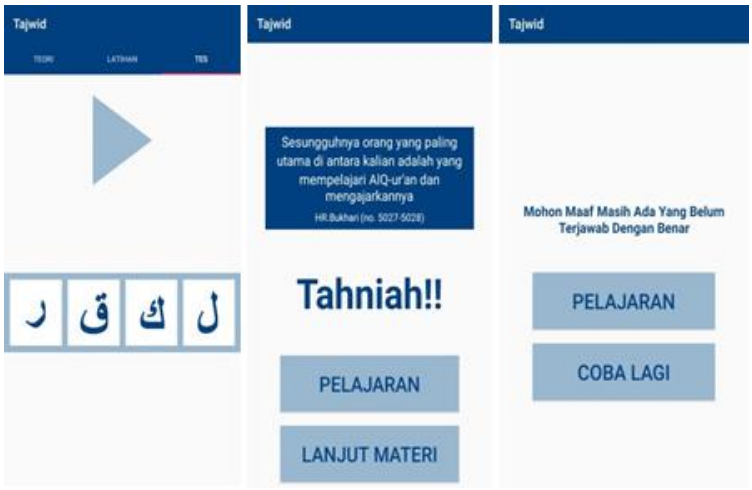

Figure 4. Test Page

Figure 4 is the Makhorijul Huruf test page. On the Makhorijul Huruf test page, there is a play menu that, when selected, will issue Audio hijaiyah letters, and the user must select the hijaiyah letter answer menu that corresponds to the audio until all test questions are completed. If the user can answer all the questions correctly, a page containing the lesson menu and other material will appear so that the user can enter the recitation material page after Makhorijul Huruf. However, if the user cannot answer all the questions correctly, a page containing the lesson menu will appear and try again so that the user cannot enter the recitation material page after Makhorijul Huruf.

3.2. Testing

The next stage is to test the application developed, which in this study, the testing process uses the Blackbox Testing and UAT methods.

1. Blackbox Testing
   Blackbox Testing, better known to many people through the term functional testing, is a software testing method used to test software where the tester does not or does not know the internal structure of the application code or program[15]. Testing Blackbox Testing Applications can be seen in Table 1.

Table 1. Blackbox Testing Applications

No	Test Description	Test Procedure	Expected Result	Result Evaluation
1	The interface of the application's main page	The application's start page	The application's start page displayed	Succeed
2	The interface of the *muqoddimah* menu	Clikc the *Muqoddimah* menu	Successfully display *muqoddimah* page	Succeed
3	The interface of the tajwid menu	Clikc the Tajweed menu	Successfully display tajweed page	Succeed
4	The interface of the nurul bayan menu	Clikc the *Nurul Bayan* menu	Successfully display *nurul bayan* page	Succeed
…	…	…	…	…
221	The interface of the successfully from *waqaf* test	Clikc the corect answer button	Successfully display successfully from *waqaf* test page	Succeed
222	The interface of the lesson menu	Clikc the lesson menu	Successfully display lesson page	Succeed

The results of the Blackbox testing on the application have the following results:

$$222/222 \times 100\% = 100\%$$

The results of the Blackbox test calculation on the Tajweed Learning Application are 100%.

2. User Acceptance Test (UAT)
UAT testing is one of the testing processes carried out in this study to produce documents that can be used as evidence that the system developed is acceptable or not by the user[16]. Testing the system with the User Acceptance Test method was carried out based on the results of the questionnaire that had previously been given to the user as many as 22 respondents, in this case consisting of the coach, principal, Musyrifah and Santriwati of the Markaz Eljawwad El Azhari Foundation. The following is a list of indicators in the UAT test:
   a. Is the application easy to use or User Friendly?
   b. Can all menu features in the application run?
   c. Can the application display explanatory information about Tajweed, Nurul Bayan and recitation material from Makhorijul Letters, Harokat?, Sifathul Huruf, Mad Ashli, Mad Far'i, Nun Sukun atau Tanwin, Mim Sukun, Tarqiq dan Tafkhim, Waqof?
   d. Does the exercise function on each subject matter go well?
   e. Does the test function on each subject matter go well?
   f. Does the audio function on each theory, practice and test of each subject matter go well?
   g. Can Applications help in understanding the subject matter of recitation?
   h. Has this application been feasible to be applied?

Based on the questionnaire results, each aspect score of the assessment with the indicators above can be calculated with the results shown in Table 2.

Table 2. The Results Of The User Acceptance Test

Respondent	Indicator Value							
	1	2	3	4	5	6	7	8
Dian Septiani	5	5	5	5	5	5	5	5
Nurmalasari	5	5	5	5	5	5	5	5
Hasyratul Najmi	5	5	5	4	5	5	5	4
Riska	5	5	5	5	4	5	5	4
…	…	…	…	…	…	…	…	…
Bunda Umek	5	5	5	5	5	5	5	5
Bunda Neneng	5	5	5	5	5	5	5	5
Total	110	110	109	108	108	108	107	108
Percentage	100%	100%	99%	98%	98%	98%	97%	98%

From the calculated UAT test results, conclusions can be drawn using the following calculation formula:

$$\frac{\text{mean}}{\text{number of respondents}} \Big/ _{5} \times 100$$

Based on the above formula, the results of the UAT test are as follows:

1) The application easy to use or User Friendly. Mean 110/22 = 5. The percentage value is 5/5 x 100% = 100%.

2) All menu features in the application run. Mean 110/22 = 5. The percentage value is 5/5 x 100% = 100%.

3) The application display explanatory information about Tajweed, Nurul Bayan and recitation material from *Makhorijul Huruf, Harokat*, *Sifathul Huruf, Mad Ashli, Mad Far'i, Nun Sukun* or *Tanwin, Mim Sukun*, *Tarqiq* and *Tafkhim*, *Waqof*. Mean 109/22 = 4,9. The percentage value is 4,9/5 x 100% = 99%.

4) The exercise function on each subject matter go well. Mean 108/22 = 4,8. The percentage value is 4,8/5 x 100% = 98%.

5) The test function on each subject matter go well. Mean 108/22 = 4,8. The percentage value is 4,8/5 x 100% = 98%.

6) The audio function on each theory, practice and test of each subject matter go well. Mean 108/22 = 4,8. The percentage value is 4,8/5 x 100% = 98%.

7) The applications help in understanding the subject matter of recitation. Mean 107/22 = 4,7. The percentage value is 4,7/5 x 100% = 97%.

8) Has this application been feasible to be applied. Mean 108/22 = 4,8. The percentage value is 4,8/5 x 100% = 98%.

The results of the *User Acceptance Test* calculation on the Tajweed Learning Application are,

$$\frac{788\%}{8} \times 100\% = 98{,}5\%.$$

4. CONCLUSION

The conclusion of this research on Markaz Eljawwad Elazhari is as Based on the results of testing using the Blackbox Testing and User Acceptance Test methods, this research has succeeded in designing and building a Tajweed Al-Qur'an Learning Application with the Android-based Nurul bayan method. User Friendly. Android-based Tajweed Learning Applications can assist users in learning the basic theory of Al-Qur'an recitation with the Nurul Bayan method. The development and advancement of technology can be used as a medium for learning the basic science of recitation of the Qur'an

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