Jurnal Mantik, 5 (4) (2022) 2805-2810

Published by:Institute of Computer Science (IOCS)

Jurnal Mantik

Journal homepage: www.iocscience.org/ejournal/index.php/mantik/index

Design of Networked Computer Learning Applications for Android-Based Beginners

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A R T I C L E I N F O

Article history:

Received: Jan 05, 2022
Revised: Jan 11, 2022
Accepted: Feb 09, 2022

Keywords:

Network Computer,
Smartphone,
Android

A B S T R A C T

Learning applications are media that can be used to convey material content involving mobile devices such as Android-based mobile phones. Computer Network is a collection of computers, as well as other supporting computer devices that are connected to each other in a single unit. In this final project, a networked computer learning media application is designed for smartphones, especially Android using the Java programming language, where there are materials and quizzes including lessons about network computers. This application can only run on smartphones based on the Android operating system.

1. Introduction

The internet is an entire computer network that is connected to each other using the global system standard Transmission Control Protocol/Internet Protocol Suite (TCP/IP) as a packet switching communication protocol to serve billions of users worldwide [1] [2] [3]. The internet has a very important role for the exchange of information and communication between individuals and social groups [4] [5] [6]. Many students are enthusiastic about learning about the internet or computer networks. This is because the network has an important role for today's information technology [7] [8]. Students have many ways to find information that they can learn about the internet or computer networks, either by reading books or browsing the internet.

The development of mobile technology is also increasingly sophisticated at this time makes it very easy for humans to do things. Not only for communicating between individuals or looking for information through a mobile that is already connected to the internet or through applications that are already available online or on a client server. In mobile applications, especially the Android application as one of the mobile operating systems that are widely used by users in the world, not many provide educational or learning applications, especially about the internet or computer networks and using the Indonesian language.

2. Method

2.1 Computer Network

A computer network is a system consisting of computers, software and other network devices that work together to achieve a common goal. The purpose of a computer network is, Share resources: share printer, CPU, memory, hard disk usage, Communication: For example electronic mail, instant messaging, chat Access to information: for example web browsing. In order to achieve the same goal, each part of the computer network requests and provides services. The party that requests/receives the service is called the client and the one who provides/sends the service is called the server. This architecture is called a client-server system and is used in almost all computer network applications [9] [10] [11].

2.2 Android

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Android is an operating system for mobile devices based on open source which includes an operating system, middleware and applications. Android provides an open platform for developers to create their initial application, Google incorporation. bought Android incorporation which is a newcomer who makes software for cell phones/smartphones. Then to develop Android, the Open Handset Alliance was formed, a consortium of 34 hardware, software, and telecommunications companies including Google, HTC, Intel, Motorola, Quaolcom, T-Mobile, and Nvidia.

At the time of the inaugural release of Android on November 5, 2007, Android together with the Open Headset Alliance stated that they supported the development of open source on mobile devices. On the other hand, Google releases android codes under the apache license, a software license and an open platform for mobile devices [12].

In this world there are 2 types of distribution of android operating system android. The first is that it has full support from Google or Google Mail Services (GMS) and the second is that it is completely free of distribution without Google's direct support, otherwise known as Open Headset Distribution (OHD).

Around September 2007 Google introduced the Nexus One, a type of smartphone that uses Android as its operating system. This cellular phone is manufactured by HTC Corporation and made available to the market on January 5, 2010. On December 9, 2008 it was announced a new member to join ARM Holdings' android work program, Atheros Communication, manufactured by Asustek Computer Inc, Garmin Ltd, Softbank, Sony Ericsson, Toshiba Corp., and Vodafone Group Plc.

Along with the formation of the Open Handset Alliance, OHA announced their first product, android, a mobile device which is a modification of the linux 2.6 kernel. Since Android was released, various updates have been made in the form of various bugs and the addition of new features.

At this time, most smartphone vendors are already producing Android-based smartphones. These vendors include HTC, Motorola, Samsung, LG, HKC, Huawei, Archos, Webstation, Camangi, Dell, Nexus, SciPhone, WayteQ, Sony Ericsson, Acer, Philips, T-Mobile, Nexian, IMO, Axus and many more. many more smartphone vendors in the world that produce android. This is because Android is an open source operating system so it is free to be distributed and used by any vendor.

Not only being an operating system on smartphones, Android is now a major competitor from Apple to the Table PC operating system. The rapid growth of Android in addition to the factors mentioned above is because Android itself is a very complete platform, both in terms of the operating system, applications and development tools, the Android application market and very high support for open source communication in the world, so that Android continues to grow rapidly both from in terms of technology and in terms of the number of devices in the world [13].

2.3 PDF

PDF (Portable Document) format is a file format created by Adobe Systems in 1993 for the purpose of exchanging digital documents. The PDF format is used to represent two-dimensional documents that include text, letters, images and two-dimensional vector graphics [14] [15]. In Acrobat 3-D, PDF capabilities also include reading three-dimensional documents. PDF has become an ISO standard on July 1, 2008 with the code ISO 32000-1:2008.

The function of pdf on android is to provide and display electronic documents on android, where the module or material contained in this application requires a pdf viewer because the material or module has a pdf extension [16].

3. Result and Discussion

In this learning application system there will only be 1 type of actor who interacts in the system environment, namely the user. Users can only read the content of the material and determine the answers to multiple choice questions that have been input by the programmer into this learning application.

The application will only run on the android operating system. And it can run on android simulator on PC or laptop. In the delivery system, the material in this application is presented in the form of a file with a .pdf extension which cannot be edited by the user. The user will answer 10 questions in the form of questions with multiple choice answers at random from 50 questions that have been prepared by the programmer.

After the user inputs the answer, the user will get a result with a numerical value that will be displayed in the form of a message box.

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3.1 Use Case

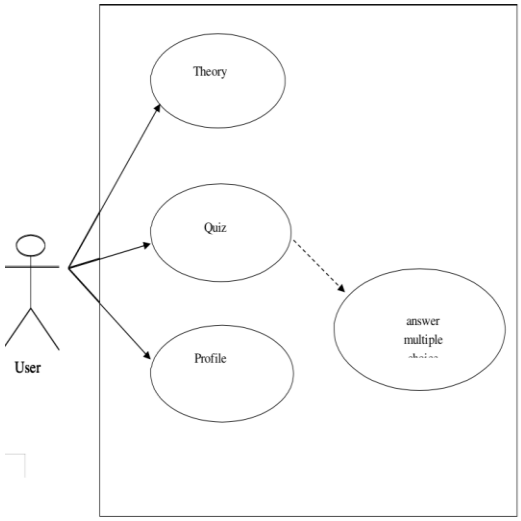

Figure 1. Usecase Application

The following is an explanation of Figure 1. The user answers questions from the quiz to test the user's ability in learning computer networks accompanied by the value of the correct answer, the user reads the material by selecting one of the titles contained in the material menu. The user views the profile of the creator of the computer network learning application.

3.2 Activity Diagram To Display Material

The following is the activity logic of the material search diagram. First, the user enters the main page and then searches for material. If the material that the user is looking for exists, the theory about the material being sought will appear, if the material being sought does not exist, the user immediately leaves.

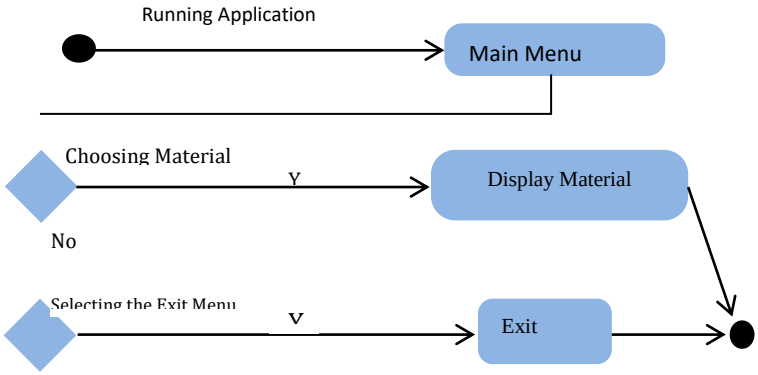

Figure 2. Activity Diagram To Display Material

3.3 Activity Diagram For Quiz

The following is a quiz activity diagram, first the user enters the quiz page by reading the questions and choosing the right answer from several questions, the final result of the quiz will appear.

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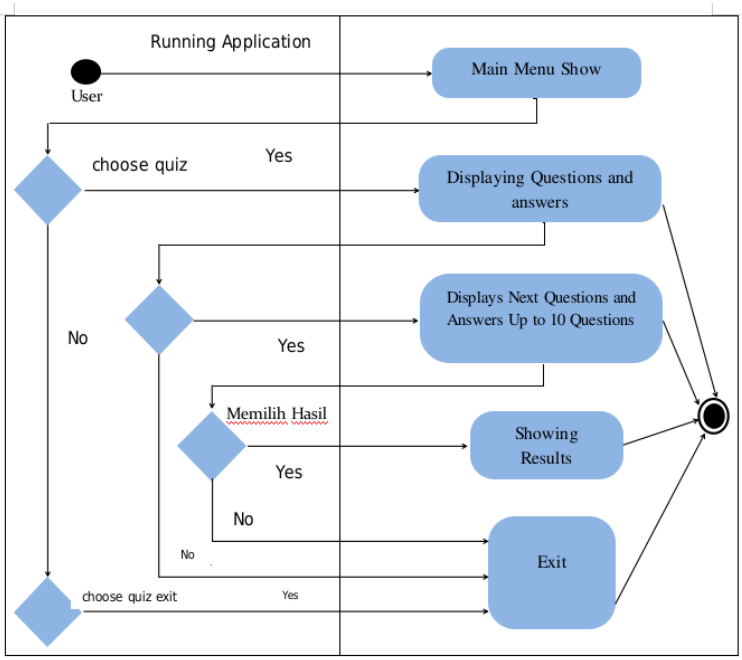

Figure 3. Activity Diagram

3.4 Material Sequ ence Diagram

Sequence diagram of the material where the user accesses data in the form of material, as shown in the following figure:

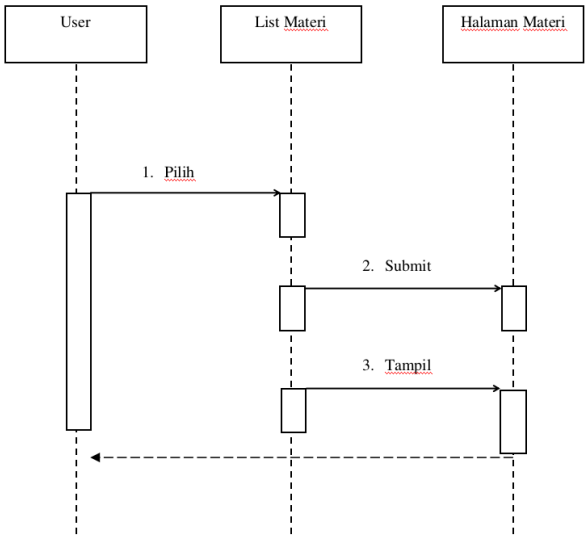

Figure 4. Material Sequence Diagram

3.5 3.5 Sequence Diagram Quiz

The quiz sequence diagram is in the form of the user's process of answering the questions that appear on the application and at the end a score will appear as the final result of the questions that have been answered. As in the following image.

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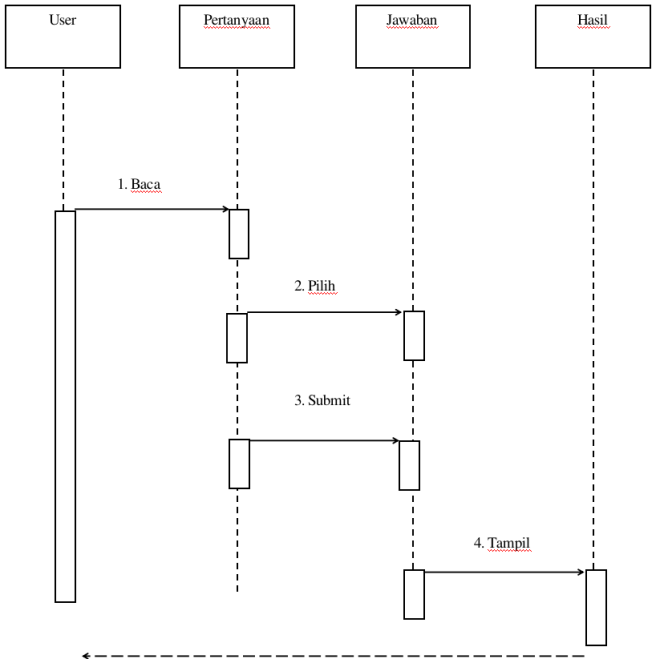

Figure 5. Sequence Diagram Quiz

4. Conclusion

From the results of the analysis and implementation of the design of the Android-based Computer Network learning application, the authors conclude, among others, as follows. Computer network learning applications make it easier for users to learn and understand about computer networks. The computer network learning application runs on the Android platform using the Java programming language in building applications on the Eclipse Galileo software. In the application there are three main menus, namely material as the main article material, and quizzes as a tester of user knowledge about computer network learning. The computer network learning application is an android-based network learning application that is only theoretical.

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