Android-based learning media design simulation license driving motor vehicles

S Rahayu*, D Sa’adillah, R A Sodikin and D Tresnawati
Department of Informatics, Sekolah Tinggi Teknologi Garut, Garut, Indonesia

*srirahayu@sttgarut.ac.id

Abstract. Driving License has become an essential factor in traffic, is also one of the requirements that must be possessed by motorcyclists. In obtaining a Driving License is not as easy as it seems, not a few people who fail in making a Driving License. The reasons vary, most frequently found is due to the difficulty of the field for the practice test and lack of ignorance in completing each of the listing tests. Apart from problems, needs be a solution, such as a learning medium for people who often fail or even for those who first want to make a Driving License. The development method used is the Multimedia Development Life Cycle (MDLC) system, such as concepts, design, material collection, assembly, testing, and distribution. This article produces a simulation design of a motor vehicle driving license that can be used on an android smartphone. The instructional media for simulating motor vehicle driving licenses to be expected to be able to illustrate making a driving license before a real practice test at the City Resort Police Station.

1. Introduction
Driving License has become an essential factor in traffic, is also one of the requirements that must be owned by motorcyclists. However, obtaining a Driving License is not as easy as it seems, not a few people who fail in making a Driving License [1-3]. The reasons vary, and most frequently found is the difficulty of the field for the practice test and the lack of ignorance in completing each test there. Apart from these problems, there needs to be a solution, such as a learning medium for people who often fail or even for those who first want to make a Driving License [4]. Information and communication technology has overgrown in influencing various kinds of media. With the advancement of information and communication technology today [5-7], which has been much associated with the multimedia field because it felt effective in delivering information [8-10].

Some of the research that the author made as a reference in the use of multimedia in various fields, including a reference to the Practice Tests of Driving License Examination. This research is intended for motorists and still desktop-based [11]. The Procedures for Whudu and Shalat for Children. In this study, the animation features created are still in the form of 2 dimensions [12]. The third research is about the Automatic Driving License Test [3]. These references will be taken regarding supporting features such as the animation of each appropriate movement [13] and an overview of simulations using Android to facilitate mobile activities [14-16]. The purpose of this article is to create a learning media for simulating an Android-based motor vehicle driving license so that it provides an overview in the written test as well as the practical test for making a Driving License for a motor vehicle based on android.
2. Methods
The method used in designing this system is the method of the Multimedia Development Life Cycle (MDLC). This multimedia development method consists of 5 stages: 1. Concept: is a stage to determine the purpose of making an application, identify from the application user, determine a concept in the application to be made, and determine the device specifications for application users and also the device specifications in making the application. 2. Design, which is a stage for designing application storyboards and also designing navigation structures from the application menus that will be created. 3. Material Collecting; where at this stage collecting material for making applications such as text, images, and video. 4. Assembly; is the implementation phase of the design of materials that have been collected previously into the coding stage. 5. Testing; is a test to check and determine the application that has been made in accordance with the previous design. And at this stage, using alpha test. As in figure 1 [17-18].

3. Results and discussion
After making observations, literature studies, and interviews, information on driving license simulations was obtained by prospective driving permit makers aged 17 years using a smartphone as a supporting device that displays a combination of text and images. The storyboard is designed to determine how the storyline or activity in the application later and the navigation structure uses a menu structure, which is a projection of the working relationship between the initial Scene and the next scene, as shown in figure 2.
Material collecting that will be used in the process of making this application, such as drawings, animations, and texts in accordance with the requirements of the design stage, is collected and prepared. For the collection of material here is done by downloading via the internet or make it yourself in accordance with what is needed in the design of the application later. Picture; Image data collection aims to obtain images in accordance with what is needed in making the application; the image file used is the .png format. Animation: Collection of animation data such as 3D objects to get the animation objects needed for later application creation, the file used is in the .fbx format; Text data collection is done by selecting the material to be presented that has been processed in the Driving License simulation application.

In the assembly phase, the assembly of all materials that have been prepared at the design stage is described in the storyboard and navigation structure. The results of this stage are shown in figure 3.
Scene 3 contains a narrative description of the procedure for making a driver's license, such as administrative completeness information for prospective applicants. Scene 4 contains information about traffic signs that must be known by prospective applicants. Scene 5 contains a simulation of a Driving License from line U, Narrow, Zigzag, and Line 8, which is usually difficult for participants to pass. An example of making a Driving License simulation using the .mp4 video animation format shown in Figure 4. Letter U and Figure 5. Line number 8.
Testing is done by alpha testing using the BlackBox testing approach. This test is carried out to determine whether the features and functions in this application can run according to user needs. Like the main menu, the procedures for making a Driving License simulation, traffic signs, driving license simulations, and other content, including navigation buttons, can all function properly. Based on testing that has been done, this application is compatible with the Android operating system version of Gingerbread, Honeycomb, Ice Cream Sandwich, Jelly Bean, Kitkat, Lollipop, and Marshmallow.

4. Conclusion
This article produces an application design about a motor vehicle driving license simulation that can be used on an Android smartphone. Driving License simulations provide facilities in the form of pages containing procedures for making licenses, traffic signs, and driving license practice test simulations with 3D animated videos to make simulations more interactive.

Acknowledgments
Thank you very much. The author says to the Garut College of Technology who has funded this article.

References
[1] Gusriani U 2015 Pelayanan Pengurusan Surat Izin Mengemudi (SIM) di Kantor Kepolisian Resort Kota (POLRESTA) Samarinda eJournal Ilmu Adm Negara 3 4
[2] Margale K A, Pawale P M, Patil A A and Waykule J 2015 Driving License Test Automation Using VB International Journal of Engineering and Applied Sciences 2(4)
[3] Gopinath V P, Sunil P S, Shantaram A R and Somwanshi S S 2017 Automatic Driving License Test with Android Application International Journal of Innovative Research in Computer and Communication Engineering 5(1)
[4] Busono T, Herman N D, Krisnanto E, Maknun J and Dewi N I K 2019 Luther’s Model Implementation on Multimedia Development for Building Construction Subject in Vocational High School (SMK) Proceedings of the 5th UPI International Conference on Technical and Vocational Education and Training (ICTVET 2018) (Atlantis Press)
[5] Irvan R, Taufiq M, Slamat C, Andrian R, Aulawi H and Ramdhani M A 2018 Early Warning System in Mobile-Based Impacted Areas Int J Eng Technol 7 118–21
[6] Delima R, Budi H, Andriyanto N and Wibowo A 2018 Development of Purchasing Module for Agriculture E-Commerce using Dynamic System Development Model Int J Adv Comput Sci Appl. 9(10) 86–96
[7] Yuliarni I, Marzal J and Kuntarto E 2019 Analysis of Multimedia Learning Mathematics Storyboard Design Int J Trends Math Educ Res. 2(3) 149
[8] Zheng H and Perez Z 2019 Design of multimedia engineering teaching system based on internet of things technology Int J Contin Eng Educ Life Long Learn. 29(4) 293–305
[9] Salahuddin M and Alam K 2016 Information and Communication Technology, electricity consumption and economic growth in OECD countries: A panel data analysis Int J Electr Power Energy Syst. 76 185–93
[10] Kaba B 2018 Modeling information and communication technology use continuance behavior: Are there differences between users on basis of their status? Int J Inf Manage. 38(1) 77–85
[11] Kurniadi Y and Radion Purba K 2016 Pembuatan Aplikasi Simulasi Ujian Praktik Pengambilan Surat Izin Mengemudi Kendaraan Roda Empat J Infra. 4(2) 110–5
[12] Rahayu S and Ardiansyah R 2016 Pengembangan Aplikasi Tata Cara Wudhu Dan Shalat Untuk Anak Menggunakan Sistem Multimedia J Algorit. 13(2) 302–8
[13] Putra C A 2018 Utilization of Multimedia Technology for Instructional Media J ICT Educ 5 1-8
[14] Mustafidah H, Febriyanto E, Suwarsito and Sriyanto S 2020 Disaster mitigation tutorial based on android J Phys Conf Ser. 1464(1) 012044
[15] Rahadian I M, Slamat C, Andrian R, Aulawi H and Ramdhani M A 2018 Early warning system in mobile-based impacted areas International Journal of Engineering & Technology (UEA)
7(3.4) 118-121

[16] Zhu Z, Zhou J, Zheng G and Zhu Y 2020 Research on Design and Simulation of Drive Power Supply Based on Linear Motor J Phys Conf Ser. 1449(1) 012075

[17] Luther A C 1994 Authoring interactive multimedia (AP Professional) p 298

[18] Sutopo H, Purnomo H D, Maria S S, Lee S, Lobodally A and Prasida A S 2019 Developing interactive bible learning model based on mobile for children ACM International Conference Proceeding Series. Association for Computing Machinery pp 279–82