ANALYSIS OF ANDROID BASED MOBILE BLOCKING APPLICATION DESIGN USING MIT APP INVENTOR

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Abstract

Mobile phone or cellphone is a device that can't be separated and left by anyone. Every day, almost every chance we see someone always holding a cellphone in every activity, whether working with full cell phone support or just mere communication needs. However, for mobile users who are busy, driving, in worship or in other circumstances, often get incoming calls or SMS that are not cold. This study presents a solution to politely block or reject incoming calls or reply automatically to SMS. The solution is in the form of developing an Android-based cell phone blocking application which becomes a backroud process to handle each event and then automatically processes it by the application. The selection of the Android platform for mobile devices because the operating system is based on the Linux kernel which is designed for mobile devices touch screen and with open source support makes it easy for application developers to freely modify and distribute in a well-known market place. From a series of experiments and analysis of applications developed, the overall application can work well with a fast response supported by simple operation methods and designs that are easy to understand so the user is greatly helpful.

Keywords: *android, linux, open source, incomming call, cell phone blocking, incoming messages, sms.*

Abstrak

Telepon genggam atau ponsel merupakan perangkat yang tidak bisa lepas dan ditinggalkan oleh siapapun. Setiap hari, hampir disetiap kesempatan kita melihat seseorang selalu memegang ponsel dalam setiap aktivitasnya, baik yang bekerja dengan dukungan ponsel sepenuhnya atau hanya sekedar kebutuhan komunikasi semata. Akan tetapi, bagi pengguna ponsel sedang sibuk, sedang mengemudi, sedang beribadah atau dalam keadaan lain seringkali mendapatkan panggilan atau SMS masuk yang tidak dinginkan. Penelitian ini memaparkan sebuah solusi untuk secara sopan melakukan pemblokiran atau penolakan terhadap panggilan masuk atau membalas SMS secara otomatis. Solusi dalam bentuk pengembangan aplikasi pemblokiran ponsel berbasis Android yang menjadi backroud process untuk menangani setiap kejadian untuk kemudian di proses secara otomatis oleh aplikasi. Adapun pemilihan platform Android untuk perangkat ponsel dikarenakan sistem operasinya berbasis kernel Linux yang didesain untuk perangkat bergerak (mobile) layar sentuh (touch screen) serta dengan dukungan sumber terbuka (open source) memudahkan para pengembang aplikasi secara bebas memodifikasi dan mendistribusikan di market place yang sudah dikenal luas. Dari serangkaian percobaan dan analisa terhadap aplikasi yang dikembangkan, secara keseluruhan aplikasi dapat bekerja secara baik dengan respon yang cepat ditunjang cara pengoperasian yang sederhana serta desain yang mudah dimengerti (user fiendly) sehingga pengguna sangat terbantu.

INTRODUCTION

One of the technological advances in the field of communication is cellphones or mobile phones. Cellphones or cellphones are increasingly used in the wider community, it depends on their use is practically easy to carry anywhere. Mobile phone manufacturers are competing to produce mobile phones with various features and sophistication. Now we can access the internet, receive and reply to emails, video calls, chat, video reply, selfi, play games, etc. using only a cellphone. But behind the sophistication of this cell phone, it also has a negative impact on its use, more important for the driver.

In Indonesia, the government has issued regulations regarding the use of mobile phones while driving. Among the factors causing traffic accidents, one of which causes the negligence of the driver because of the allocation on the road when actively using a cellphone so that neglect and can be fatal. Even reports from the federal government in America, more than 3,000 people were killed in the streets of the U.S. Every year due to traffic accidents, while cellphone use is a common disruption to driving [1].

By the government, the ban has been regulated in Law No. 22 of 2009 concerning Traffic and Road Transportation clearly states in Article 106 paragraph (1), "Every person who drives a motorized vehicle on the road must drive his vehicle properly and with full concentration". The law can be interpreted that every driver (driver) is obliged to drive with full concentration, and does not carry out activities that could potentially cause a traffic accident [2].

For this reason, efforts are needed to control the way and where cellphones are used. Several previous studies have also provided various solutions with different methods so that motorists can more easily interact with cellphones or mobile phones. Starting from the messaging system using the API with Google Android voice recognition by Khalil et al (2012) to the observation of differences in techniques and algorithms in Speech to Text (STT) and Text to Speech (TTS) "Speech to text and text to speech recognition systems-Areview [3].

According to the author's analysis, after reading the discussion of each of the previous studies, whatever the method and method used in responding to incoming calls or SMS still interacts with the cellphone used, even with the no touch concept. This can clearly disrupt concentration while driving and violate traffic laws.

On the other hand, ignoring someone's calls or texts ethically and social norms is also considered unfavorable. Finnegan, a creative writing student at San Francisco University, has the idea of designing an application called "No Text While Driving" using Google's App Inventor. A tool that is easy enough with a simple application for Android phones by installing bits of code and bricks [4].

Based on the background above, it is deemed necessary to conduct a study in analyzing and designing a cell phone blocking system or application through responding to incoming calls or SMS without disturbing the driver while driving because by simply pressing the button on the application before leaving, the driver is free from social problems and driving to be safer. The main

contribution of this application is not only for the driver but can also be used by anyone whether it's busy, in a meeting, are carrying out worship, or other circumstances that do not allow someone to respond to all these events and interact with his cellphone.

LITERATRE REVIEW

Mobile phones or commonly called cellphones are electronic mobile telecommunications devices with the same basic capabilities and functions as conventional fixed line telephones, the difference can be used anywhere (*portable*), and at any time (*mobile*) and does not require a connection like a telephone network using cables. In general, cell phones can function to receive and make phone calls, and can receive and send short messages (SMS). Now, the function of a mobile phone is more than that, even it has become a multifunctional smartphone (smartphone). Along with the development of digital and information technology, mobile phones are now equipped with various features, such as playing games, chatting facilities, being able to capture and receive radio and television broadcasts, digital cameras, internet services, and audio and video player software [5].

The development of mobile phones or mobile phones can not be separated from the support of various mobile operating systems, one of which is popular is Android. Android is a Linux kernel based operating system designed for touch screen devices, for example smartphones. Early in its development, Android under the company Android, Inc., with full financial support from Google, which was later acquired in 2005. The mobile operating system was officially released for the first time in 2007, at the same time the Open Handset Alliance (OHA), the

association was founded. from hardware companies, software, and telecommunications companies or operators with the aim of advancing the open standards of cellular devices. Adroid with the main robot mascot green becomes more popular because the interface is easy to use generally in the form of touch screen movements, for example tapping, sliding, and pinching, and a virtual keyboard for writing text or words [6].

Figure 1. Smartphone with Android Operating System

Android is the most widely used mobile operating system with open source, and Google released the code under the Apache License, a free software license written by the Apache Software Foundation (ASF). Open source code and licensing licenses on Android make it easy for application software to be modified (modified) freely and distributed or marketed by device makers, wireless operators or companies, and application developers, including software application that runs on Android.

MIT App Inventor is an open source web application (open source) and at the beginning of its development under a leading company, Google. Currently App Inventor is managed by the Massachusetts Institute of Technology (MIT). The initial purpose of App Inventor is to provide convenience for students and teachers in

learning, especially in terms of application programming in the Android platform environment. Making Android applications is identical to the obligation to learn and master Java programming languages that are classified as high-level languages and are considered quite difficult [7].

Figure 2. Smartphone with Android Operating System

App Inventor is a free cloud-based service that allows you to create your own mobile application using a block-based programming language visually. App Inventor can be run or accessed using a web browser (Chrome, Firefox, Safari, etc.) both online using an internet connection and offline without using an internet connection. With App Inventor making Android applications becomes easier to understand for ordinary people though. Users simply click and drag (drag-and-frop) to add the steps they want to do [8].

METHOD

To analyze a system it is necessary to first design a cell phone blocking application. Where, this application is made based on mobile which has an Android operating system. The choice of the Android operating system is because Android is an open source operating system, so users and application developers can easily create and install the desired applications. This mobile blocking application will be designed using MIT App Inventor, with a block-based programming language [9].

The initial step in developing applications is the existence of a basic architecture as a framework that presents the pattern of technological relationships and the methods used and their functions. The architecture of mobile blocking applications as shown in Figure 3 can be explained as follows; There are 4 main entities consisting of, the caller or sender of an SMS (Caller), telephone receiver or sms (Receiver), cellular network both owned by Caller and Receiver (Provider, ISP), and applications installed on Android-based devices. Cellphone blocking application must be installed on the Receiver device which will block or reject incoming calls or SMS, while on the Caller device the application does not have to be installed nor does it have to be Android based [10]. This mobile blocking application can work on all cellular networks, especially GSM and can be used to block calls or SMS both fellow operators and with other operators [11].
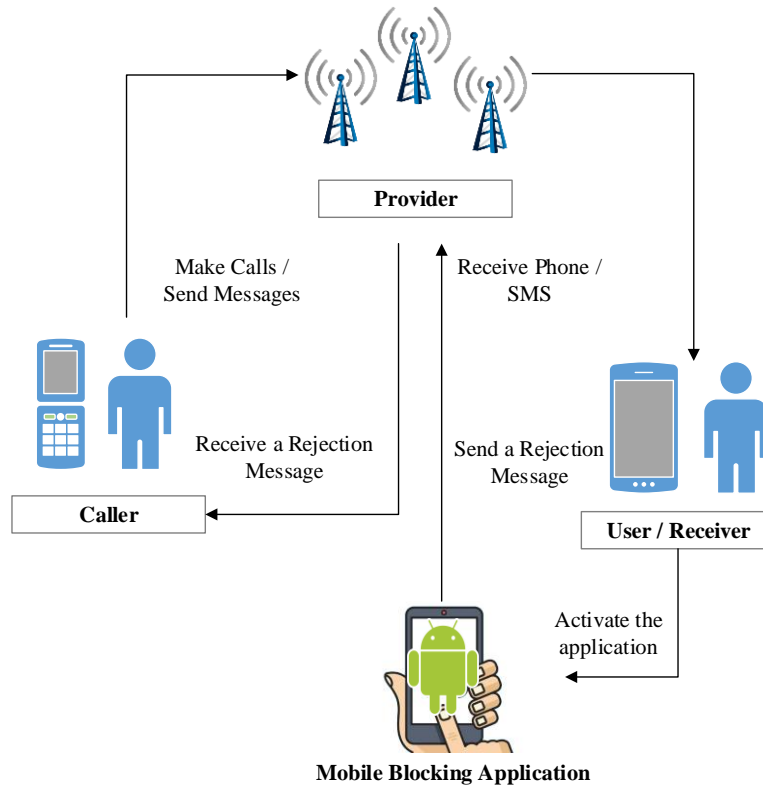
Figure 3. Cellular Blocking System Architecture

RESULT AND DISCUS

In building a system the stages of work required by a system analyst or programmer are required. The whole process in building the system using the SDLC (Software Development Life Cycle) method. The results of the system design are implemented with UML (Unified Modeling Language). So that it can then be implemented and tested to draw some conclusions. The brief form of UML will be explained in Figure 4 as shown below:
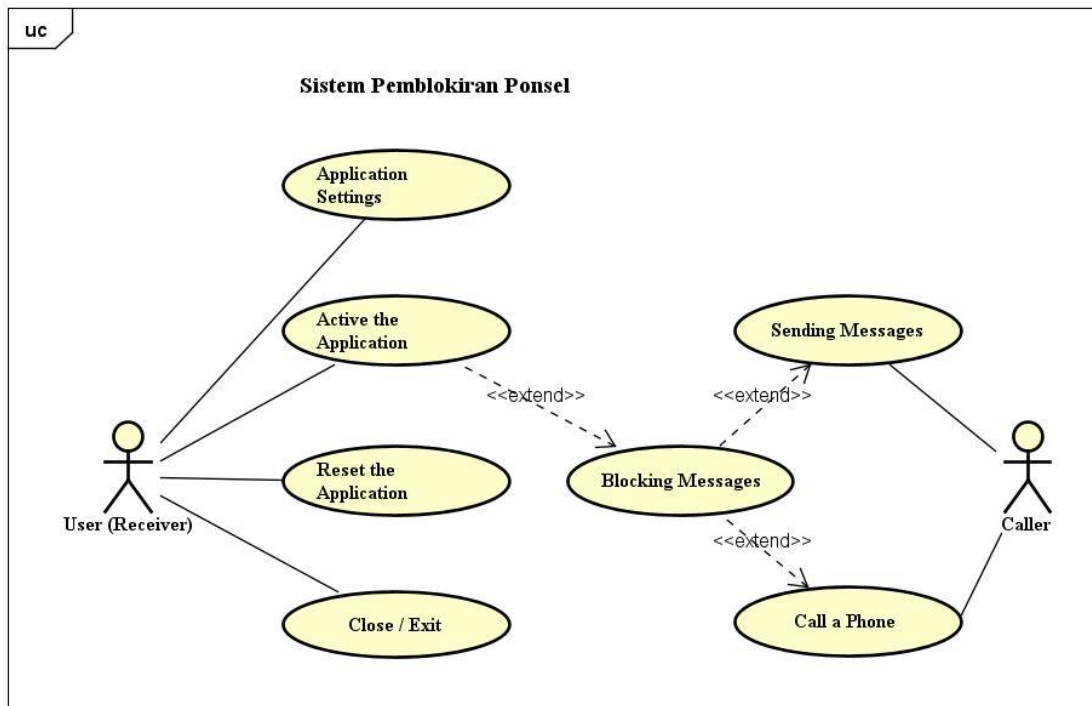
Figure 4. Use Case Diagram Cellphone Blocking Application

From the Use Case diagram above, it can be seen that there are 2 actors, namely User (Receiver) and Caller where the system will integrate with each of these actors. The function of the actor is as a trigger (Triger) of the application. First the device holder (User / Receiver) makes settings for the application, which is setting the message to be sent and activating the application as a background process, after which the application enters in a loop forever and waits for a triger in the form of incoming calls or sms that is captured by the application and responds to it by blocking cell [11].

Cellphone blocking is done by rejecting (sending) and sending messages that have been set previously to the number of the caller or the sender of the sms (Caller). As for the device holder (User / Receiver) will not know of an incoming call or SMS either display incoming calls on the screen or listen to the ringtone only because the device automatically rejects the call (reject) and

will know after a notification SMS reply has been sent. On the other side of the caller device (Caller) will also not be connected because the call is automatically rejected and only realized that the destination number (Receiver) is not being able to be contacted or receive a call via short message (SMS reply received) [12]. The results of application development can be seen in the form of the main (sreen shoot), as in Figure 5.

Figure 5. Main Display Cellphone Blocking Application

From Figure 5 it can be explained that in the application a message (SMS) must be written which functions as a reply SMS to incoming SMS or blocking SMS to incoming calls that will be sent automatically to the number of the sender of the sms or the caller (Caller) by tapping the Save button. By tapping the Save button the application will activate in the background process on the device being used. In addition to the Save button, there is also a Delete button that works to delete the contents of messages that have been previously saved in the application or to write a new message. The next button is Clear History which serves to clear all the events (logs) of applications contained on

the device. While the Exit button works to end all application activities and exit the application that is being used. Furthermore, for the purposes of this study the application will record all events as shown in Figure 6. [13]

Figure 6. Settings, Activating and Response Logs Mobile Blocking Application

To test the success of cell phone blocking applications, the authors conducted a study by sending an SMS and making calls to devices that have a cell phone blocking application installed with results as shown in Table 1.

Tabel 1. Cell Phone Blocking Response Testing Application

No	Incoming SMS and SMS Reply		
1	Incoming SMS	From Number	+62 831 8125 0999
		Fill SMS	Hi, apa kabar?
		Date / Time	Fri, 06 Des 2019, 05:05:27 PM
2	SMS Reply	Status	Diterima
		Isi SMS	ujicoba sms auto reject
		Date / Time	Fri, 06 Des 2019, 05:05 PM

No	Incoming Calls and Blocking SMS		
1	Incoming Calls	From Number	+6283181250999
		Date / Time	Fri, 06 Des 2019, 05:03:27 PM
		Status	Ditolak
2	Blocking SMS	Status	Diterima
		Fill SMS	ujicoba sms auto reject
		Date / Time	Fri, 06 Des 2019, 05:03:27 PM

In this experiment, the writer made a call and sent an SMS from a Cellphone Number +6283181250999 (Caller) to a Cellphone Number +6285375096667 (Receiver) that had a cellphone blocking application installed, while both Cellphone Numbers were supported by different GSM Providers. In addition to Table 1, the results are also shown in Figure 6. The author's analysis shows that the application is running smoothly and the response is very fast, taking just a few seconds [14].

To strengthen the results of the following experiment the authors present a screenshot of the screen when the Caller makes a call and sends an SMS to the Receiver.
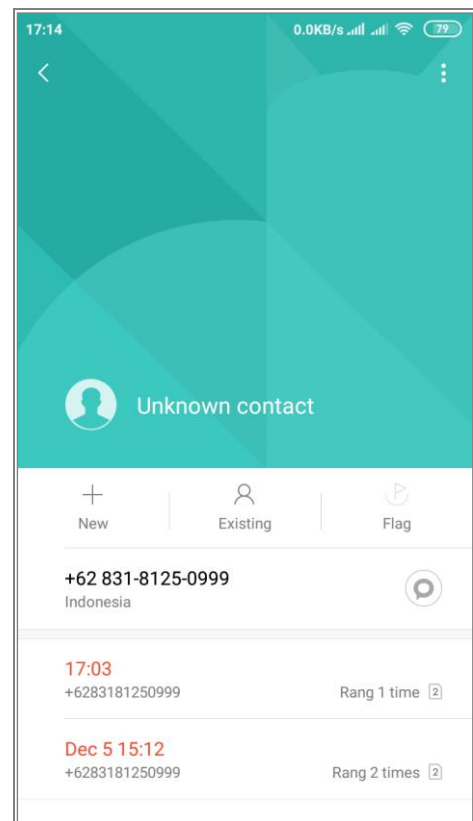

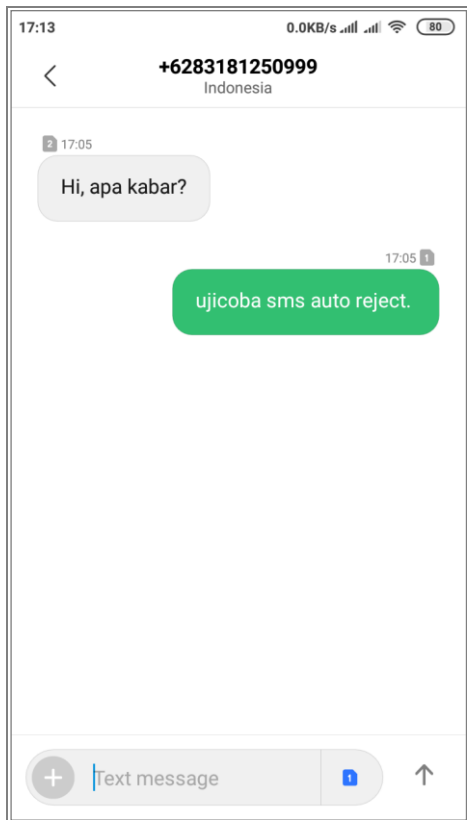**Figure 7.** Display Screen On Receiver Devices After an Incoming Call

Figure 8. Display Screen On Receiver Devices After Sending an SMS

The trial results are very satisfying and as desired, but beyond the writer's guess, it turns out that the application only works and responds to incoming calls or SMS only from the Customer's mobile number, whereas from special numbers such as those from the Provider or other Customer service numbers the application does not respond. This can be seen from the incoming SMS from the Provider (Telkomsel) on the cell phone blocking application, only recording the date and time of the event and the contents of the SMS, while the Provider's number cannot be recognized (null) [15].

From this case, the authors analyze that the application does not respond to incoming SMS from Provider numbers or other customer services because the Caller ID is not a common arrangement of numbers and does not begin with a country code such as Indonesia (+62) and

also the type of SMS sent does not require a reply like SMS in general and the server from the Provider itself that does not allow to do a reply message. This, being a drawback from the mobile blocking application that the authors developed. In addition, the mobile blocking application also cannot respond to incoming calls and / or SMS if the devices used do not have enough credit according to the rates that are applied to each relevant provider [16].

Figure 9. Display of Incoming SMS from Telkomsel Provider on Mobile Blocking Application
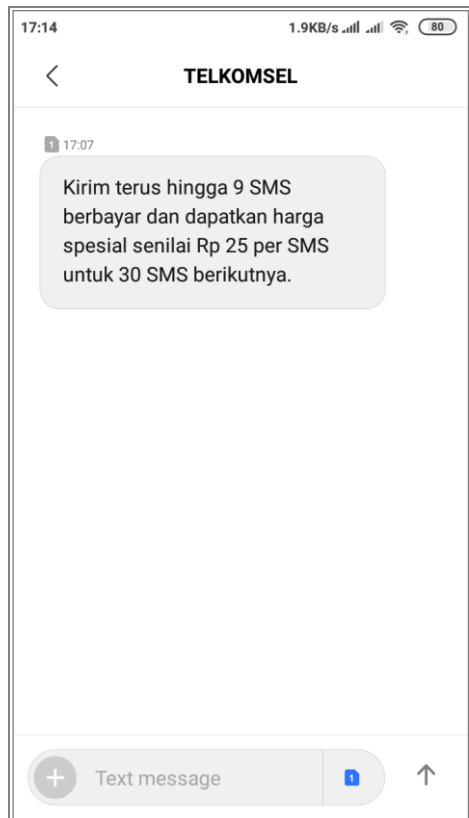
Figure 10. Display Screen On Receiver Devices When an Incoming SMS comes from Telkomsel Provider

CONCLUSION

Display Screen On Receiver Devices Based on the results and discussion in the previous description, it can be concluded, the mobile blocking application makes a positive contribution to the community, not only for the driver (driver) but can also be used by anyone especially for blocking incoming calls and or SMS by sending SMS notifications or SMS reply if you're driving, in a busy condition, in a meeting (meeting), are in worship, or other circumstances that do not allow someone to reply to an SMS or receive an incoming call. Overall mobile blocking application can work well by providing a fast response to various circumstances. On the other hand, there are deficiencies in responding to incoming SMS, especially from Provider numbers or other

Customer service numbers, this is a suggestion for subsequent researchers to be able to overcome them and develop applications to be even more leverage. In addition, the device that uses a cell phone blocking application must have enough credit to send a reply SMS or SMS blocking according to the rates imposed by the relevant provider.When an Incoming SMS comes from Telkomsel Provider.

BIBLIOGRAPHY

[1] L. F. Liisa Ecola, Steven W. Popper, Richard Silberglitt, "The Road to Zero - A Vision for Achieving Zero Roadway Death by 2005," 2018.

[2] Ayoselamat.org, "Undang-Undang yang Mengatur Tentang Penggunaan HP Saat Berkendara," *03 Oktober*, 2014. [Online]. Available: Undang-Undang yang Mengatur Tentang Penggunaan HP Saat Berkendara.

[3] A. Trivedi, N. Pant, P. Shah, S. Sonik, and S. Agrawal, "Speech to text and text to speech recognition systems-Areview," *IOSR J. Comput. Eng.*, vol. 20, no. 2, pp. 36–43, 2018, doi: 10.9790/0661-2002013643.

[4] C. Thompson, "No Texting While Driving," no. January, 2010.

[5] Wikipedia.org, "Telepon Genggam," *07 Desember*, 2019. [Online]. Available: https://id.wikipedia.org/wiki/Telepon_genggam. [Accessed: 02-Dec-2019].

[6] Wikipedia.org, "Android Sistem Operasi," *26 Desember*, 2019.

[7] A. Ismayani, "Cara Mudah Membuat Aplikasi Pembelajaran Berbasis Android Dengan Thunkable," *Elex Media Komputindo, Oktober*, p. , 2018,

doi: 10.1017/CBO9781107415324.004.

[8] H. W. S. R. S. Wiyardi, "Education Berbasis Android Sebagai Media Pembelajaran yang Mandiri dan Interaktiv," *J. Educ.*, vol. 4, no. 1, pp. 24–30, 2015.

[9] K. Dwinaputri, "Pengenalan App Inventor," 2017.

[10] W. Hsu and S. Margo, "Method of Responding to Incoming Calls and Messages While Driving," vol. 2, no. 12, 2014.

[11] Wijanarto, "Aplikasi Pengirim SMS Otomatis untuk Incoming Call dan SMS," *Semin. Nas. Apl. Teknol. Inf.*, pp. 18–21, 2013.

[12] M. P. Admane, "Interaction System with Smart Phones By Speech to Text and Accelerometer," vol. 3, no. 4, pp. 1092–1097, 2014.

[13] A. Effendi, "Prototype Auto SMS Responder Berbasis Android Untuk SMS dan Panggilan Tak Terjawab," *Dok. Karya Ilmia - Progr. Stud. Tek. Inform. - Fak. Ilmu Komput. - Univ. Dian Nuswantoro Semarang*, vol. 1, pp. 3–4, 2013.

[14] T. Takala, M. Katara, and J. Harty, "Experiences of system-level model-based GUI testing of an android application," *Proc. - 4th IEEE Int. Conf. Softw. Testing, Verif. Validation, ICST 2011*, no. March 2011, pp. 377–386, 2011, doi: 10.1109/ICST.2011.11.

[15] H. Tolle and M. T. Ananta, "Pengembangan Aplikasi Respons Sms Dan Panggilan Telepon Menggunakan Android Text To Speech Dan Proximity Sensor Bagi Pengemudi Mobil," *J. Pengemb. Teknol. Inf. dan Ilmu Komput. Univ. Brawijaya*, vol. 1, no. 8, pp. 688–696, 2017.

[16] K. Kuppusamy, "A Model for Remote Access and Protection of Smartphones Using Short Message Service," *Int. J. Comput. Sci. Eng. Inf. Technol.*, vol. 2, no. 1, pp. 95–104, 2012, doi: 10.5121/ijcseit.2012.2109.