LAW ENFORCEMENT IN SMART TRANSPORTATION SYSTEMS ON HIGHWAY

Nur Kumala Dewi[1] and Arman Syah Putra[2]

STMIK Muhammadiyah Jakarta[1]
STMIK Insan Pembangunan[2]

nkd.mandori@gmail.com[1]
armansp892@gmail.com[2]

ABSTRACT

This research was employed due to the law enforcement on the highways that is still considered less optimal. Law enforcement on the highways, especially in the transportation field, will be maximized with the existence of such a system. With this perspective in mind, all violations can be recorded and there is no selective action. The method used in this research is the literature review. By employing this method, this present research will be the most recent study in the field. Moreover, all the information from the previous researches have added a value to this research. The issue posed in this research is that there is a shortfall of police staff engaged in surveillance and prosecution on the highway. With these deficiencies, creating system is the solution to all of the problems. This particular system can benefit the police. Therefore, this research will propose a system that will be able to assist the police in conducting surveillance and law enforcement in the transportation sector, especially on highways.

Keywords: Law Enforcement, Smart Transportation System, Highway

INTRODUCTION

The law in the field of transportation is not maximal, because the number of police personnel is still insufficient (Putra et al., 2020). In response to the lack of an ideal number of police officers, one of the solutions offered is to create a system related to the highway transport system (Putra et al., 2018). It involves many things such as community, police, local government and banks. Therefore, law enforcement must be carried out and not selective even if it is carried out with a sophisticated system (Putra et al., 2018).

The current law enforcement system on highway uses a tool named CCTV (Closed-Circuit Television) that is placed somewhere around the highway. In order to retrieve evidence of a violation committed by motorists on the highway, using this system will more or less assist the police to enforce the law on the highway (Dewi & Putra, 2020). The problem raised in this research is how to develop an existing system with an even more sophisticated system. This is since everything is changing and technological sophistication will be certainly increasing (Dewi, Mulyana, Putra, & Radita, 2020). Therefore, there must be a development from the existing system to a more sophisticated one (Dewi, Irawan, Fitry, & Putra, 2020).

The method used in this research is quantitative method. It is based on a literature review of previous studies (Putra, 2020). By employing this method, this present research will be the most recent study in the field. Moreover, all the information from the previous researches have added a value to this research. In this research, we will propose a system that can be adapted to the previous system. This research is expected to become the latest research in the field and can be used as a basis for future research (Ramadhan, Kurniawan, & Putra, 2020) which has similar topic. This means that the system proposed will be a system that helps all parties, especially the police officers (Subani, Ramadhan, Sumarno, & Putra, 2020).

METHOD

This section will discuss how this research took place and what methods used in this research (Putra, Harco, Ford, Benfano, & Edi, 2018). The explanation is illustrated in Figure 1:

Figure 1. Research Method

As illustrated in Figure 1, there are three steps in undertaking quantitative method in this research, consisting of literature review, problem research, and result and application.

Literature Review

In this research, the researchers firstly undertook the literature review method by reading a number of related books and journals (Putra, 2020). By conducting the literature review, the research process was started and continued to the next process, namely finding problems in the existing journals.

Research Problem

This stage is the process of finding problems based on the previous researches (Ramadhan, Kurniawan, & Putra, 2020). Henceforth, what raised in this research is a number of recent and non-existent problems. This research will have a research flow. This also has clear research objectives. Furthermore, the results of this study can be continued into further research (Putra, 2019). The final stage in this research is to find out a solution or system proposal as a response to the problems arisen in the previous stage (Putra, 2019). By finding a solution, this research will be accomplished and can assist many parties, especially the police officers. With the proposed system in this research, the transportation sector, especially in the traffic sector, will be more under controlled. This, then, can be the solution for the existing systems and become the research materials for the future researchers (Putra, 2019).

FINDINGS AND DISCUSSION

This section will explain how the data are processed and obtained. After obtaining the data, the use of the data will be carried out in the research section. At this point, it will produce a clear objective to solve the research problems previously explained in the beginning of the section.

Table 1. Literature Review

No	*Author*	*Year*	*Conclusion*	*Journal*
1	Putra et al.	2018	There are four inspections that are important in a smart transportation system, especially in the smart city of Jakarta. By having good management transportation management, it will be able to produce a good surveillance and enforcement system.	International Conference on INAPR Jakarta
2	Putra et al.	2018	The use of technology in the transportation system is very helpful,	International Conference on

			especially with the application of internet media. All surveillance can be done online, and can be done remotely and with one door system.	INAPR Jakarta
3	Hartawan, Putra, & Muktiono	2020	The use of a smart card in a transportation system will really help many parties. From the public perspective, it will be greatly assisted because the one-time payment system and the transportation system can be used maximally.	International Journal of Science, Technology & Management
4	Putra	2020	A smart city uses a lot of underpass road systems. With an underpass road system, it is expected to be able to reduce congestion that occurs at the corners of the red lights. This system, previously had to be postponed. Now it does not need to wait, because they can immediately run through the system.	TEKINFO Jurnal Ilmiah Teknik Informatika Universitas Persada Indonesia YAI
5	Putra	2020	Payment using the electronic road pricing system is one method that is widely used abroad, especially in developing countries. This is because this payment system is very effective. Furthermore, it does not need to use many systems and transactions can be done on the spot.	Jurnal Informatika Universitas Pamulang
6	Dewi & Putra	2020	The development of the millennial generation is currently influenced by urban development. The development of the City of Jakarta has developed rapidly. Jakarta is a smart city and one of the largest cities in the world. By this influence, the development of generations in a city is also influenced by the existence of that city.	Jurnal Informatika Universitas Pamulang

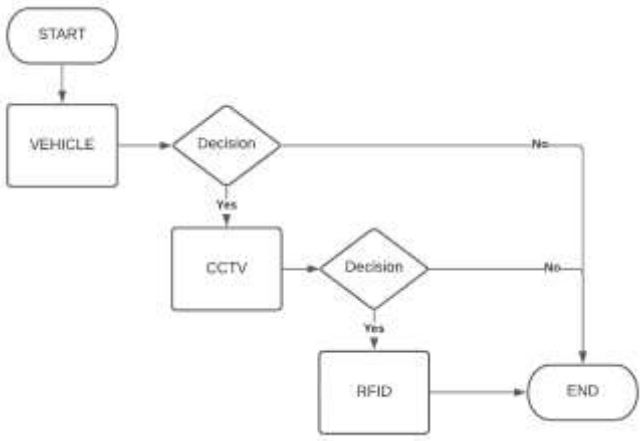

Figure 2. Flowchart System

Based on the flowchart, the flow of a system starts from a vehicle that commits a violation on the highway. The violation will then be recorded by CCTV. Next, the vehicle will be

deducted through a device placed in the vehicle named RFID. The RFID balance will be deducted due to a violation on the highway. The penalty is equivalent to a fine for infringements committed by users of motor vehicles.

In the next page, there is a picture of the proposed system which is developed based on the previous studies. The image will explain how a system will be developed from the previous system. This is the proposed system on how the police officers do their work in carrying out prosecution in the traffic sector and give fine penalties to lawbreakers in the transportation sector.

Figure 3. A Proposed System

Vehicle
The vehicle in this research is a car that has a device in the form of RFID installed in the vehicle. Then, the vehicle can record by itself if it makes a mistake. In the RFID device, there is a balance that can be deducted if the vehicle commits a violation on the highway (Putra & Kusuma, 2015).

CCTV
CCTV in this research is a tool used to record errors or violations committed by motor vehicles on the highway. The presence of CCTV helps a lot. The evidence of errors in the form of images and videos, with strong evidence, then a ticket penalty or balance deduction on RFID can be deducted as soon as possible (Putra, 2020).

System
The system in this research is to record evidence from CCTV and to carry out the process of giving punishment to vehicle offenders on the highway. Using this system, they will be connected to a device called RFID in the vehicle. RFID devices are put in the motor vehicles. Moreover, it will carry out the process of reducing the RFID existing balance if there is a violation (Putra & Fatrilia, 2020).

RFID
In this research, RFID is a device that is put on a motor vehicle (Putra & Harco, 2018). It contains data and balances from motor vehicle users. By the presence of RFID, violations committed by vehicle users can be immediately given a fine and will be deducted from the RFID existing balance (Putra & Warnars, 2018).

By providing this system, the existing system can adapt and will be able to change the system of fines which is usually done in courts and banks. Thus, by using this system, fines can be given if there is a breach.

CONCLUSION
The RFID and CCTV systems are the systems that are most commonly used to carry out road legal actions, especially in the transportation sector. By the existence of these two systems, the system

that previously existed will be much more effective in carrying out legal enforcement against road traffic violations.

There will be a great deal of research in the future to make an application relevant to the payment system for penalties that can be made directly on the highway. This application would significantly encourage the police to take action and the judicial process will run properly.

REFERENCES

Dewi, N. K., & Putra, A. S. (2020). Perkembangan Gamification dan Dampak Game Online terhadap Jiwa Manusia di Kota Pintar DKI Jakarta. *Jurnal Informatika Universitas Pamulang*, *5*(3), 315-320.

Dewi, N. K., & Putra, A. S. (2020). Sistem penunjang keputusan penerimaan karyawan baru dengan algoritma greedy. *Jurnal Visualika*, *6*(2), 154-160.

Dewi, N. K., Irawan, B. H., Fitry, E., & Putra, A. S. (2020). Konsep Aplikasi E-Dakwah Untuk Generasi Milenial Jakarta. *IKRA-ITH INFORMATIKA: Jurnal Komputer dan Informatika*, *5*(2), 26-33.

Dewi, N. K., Mulyana, I., Putra, A. S., & Radita, F. R. (2020). Konsep Robot Penjaga Toko Di Kombinasikan Dengan Pengendalian Virtual Reality (VR) Jarak Jauh. *IKRA-ITH INFORMATIKA: Jurnal Komputer dan Informatika*, *5*(1), 33-38.

Hartawan, M. S., Putra, A. S., & Muktiono, A. (2020). Smart City Concept for Integrated Citizen Information Smart Card or ICISC in DKI Jakarta. *International Journal of Science, Technology & Management*, *1*(4), 364-370.

Putra, A. S. (2020). Analisa Dan Perancangan Sistem Pembelian Makanan Di Restoran Pada Masa Pandemic Coronavirus Disease 2019 (Covid-19). *Jurnal Esensi Komputasi (Jurnal Esensi Sistem Komputer dan Informasi)*, *4*(2), 10-15.

Putra, A. S. (2020). Efektifitas Sistem Jalan Underpass untuk Kota Pintar DKI Jakarta. *Jurnal Informatika Universitas Pamulang*, *5*(3), 220-227.

Putra, A. S. (2019). "Smart City: Ganjil Genap Solusi Atau Masalah Di DKI Jakarta". *Jurnal IKRA-ITH Informatika Vol 3 No 3, ISSN 25804316* , .

Putra, A. S. (2019). "Smart City: konsep Kota pintar di DKI Jakarta". *Jurnal TEKINFO, Vol 20, No 2, Hal 1-111, ISSN 1411-3635*.

Putra, A. S. (2019). "Penggabungan Wilayah Kota Bekasi Dan Kota Tangerang Ke Wilayang Ibu Kota DKI Jakarta Berdasarkan Undang-Undang Nomor 23 Pasal 32 Tahun 2019 Dapat Membantu Mengwujudkan DKI Jakarta Menjadi Kota Pintar". *Jurnal IPSIKOM VOL 7 No. 2*.

Putra, A. S. (2020). Konsep Kota Pintar Dalam Penerapan Sistem Pembayaran Menggunakan Kode QR Pada Pemesanan Tiket Elektronik. *TEKINFO Jurnal Ilmiah Teknik Informatika*, *21*, 1-15.

Putra, A. S. (2020). Penerapan Konsep Kota Pintar dengan Cara Penerapan ERP (Electronic Road Price) di Jalan Ibu Kota DKI Jakarta. Jurnal Informatika Universitas Pamulang, 5(1), 13-18. *Jurnal Informatika Universitas Pamulang, 5(1), 13-18.*, 13-18.

Putra, A. S. (2020). Teknologi Informasi (IT) Sebagai Alat Syiar Budaya Islam Di Bumi Nusantara Indonesia. *Seminar Nasional Universitas Indraprasta (SINASIS)*, 200-215.

Putra, A. S., & Fatrilia, R. R. (2020). Paradigma Belajar Mengaji Secara Online Pada Masa Pandemic Coronavirus Disease 2019 (Covid-19). *MATAAZIR: Jurnal Administrasi dan Manajemen Pendidikan*, 49-61.

Putra, A. S., & Harco , L. W. (2018). Intelligent Traffic Monitoring System (ITMS) for Smart City Based on IoT Monitoring. *Indonesian Association for Pattern Recognition International Conference (INAPR) IEEE*, 161-165.

Putra, A. S., Harco , L. W., Bahtiar , S. A., Agung , T., Wayan, S., & Chu-, H. K. (2018). Gamification in the e-Learning Process for children with Attention Deficit Hyperactivity Disorder (ADHD). *Indonesian Association for Pattern Recognition International Conference (INAPR) IEEE*, 182-185.

Putra, A. S., Harco , L. W., Ford , L. G., Benfano, S., & Edi , A. (2018). A Proposed surveillance model in an Intelligent Transportation System (ITS). *Indonesian Association for Pattern Recognition International Conference (INAPR) IEEE*, 156-160.

Putra, A. S., & Kusuma, H. (2015). Pengembangan Sistem Career Center untuk Departemen Konseling dan Pengembangan Karir di Institut Teknologi Budi Utomo. *Jurnal Khatulistiwa Informatika*, 133-143.

Putra, A. S., Novitasari, D., Asbari, M., Purwanto, A., Iskandar, J., Hutagalung, D., & Cahyono, Y. (2020). Examine Relationship of Soft Skills, Hard Skills, Innovation and Performance: the Mediation Effect of Organizational Learning. *International Journal of Science and Management Studies (IJSMS)*, *3*(3), 27-43.

Putra, A. S., & Warnars, H. L. H. S. (2018, September). Intelligent traffic monitoring system (ITMS) for smart city based on IoT monitoring. In *2018 Indonesian Association for Pattern Recognition International Conference (INAPR)* (pp. 161-165). IEEE.

Putra, A. S., Warnars, H. L., Abbas, B. S., Trisetyarso, A., Suparta, W., & Ho Kang, C. (2019). "Gamification in the e-Learning Process for children with Attention Deficit Hyperactivity Disorder (ADHD)". *1st 2018 Indonesian Association for Pattern Recognit INAPR*, 182-185.

Putra, A. S., Warnars, H. L. H. S., Gaol, F. L., Soewito, B., & Abdurachman, E. (2018, September). A Proposed surveillance model in an Intelligent Transportation System (ITS). In *2018 Indonesian Association for Pattern Recognition International Conference (INAPR)* (pp. 156-160). IEEE.

Ramadhan, I., Kurniawan, A., & Putra, A. S. (2020). Penentuan Pola Penindakan Pelanggaran Lalu Lintas di DKI Jakarta Menggunakan Metode Analytic Network Process (ANP). *IKRA-ITH INFORMATIKA: Jurnal Komputer dan Informatika*, *5*(1), 51-57.

Subani, M., Ramadhan, I., Sumarno , & Putra, A. S. (2020). Perkembangan Internet of Think (IOT) dan Instalasi Komputer Terhadap Perkembangan Kota Pintar di Ibukota Dki Jakarta. *IKRA-ITH INFORMATIKA: Jurnal Komputer dan Informatika*, *5*(1), 88-93.